ApexPro™
Telemetry Transmitter
Service Manual

2001989-103 Revision A

GE Medical Systems
Information Technologies

gemedical.com

NOTE: The information in this manual only applies to ApexPro Telemetry Transmitter software version 3A. It does not apply to earlier software versions. Due to continuing product innovation, specifications in this manual are subject to change without notice.

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1 Introduction

For your notes

Manual Information

Revision History

Each page of this manual has a revision letter located at the bottom of the page. It identifies the revision level of the entire manual. This may be important if you have different manuals and you don't know which is the most current.

For the initial release, all pages have the revision letter A. For the second update, all pages receive the revision letter B. The latest letter of the alphabet added to the table below corresponds to the most current revision.

Revision History		
Revision	**Date**	**Comment**
A	10 April 2002	Initial Release

Purpose

This manual provides technical information for service representatives and technical personnel involved in maintaining the ApexPro transmitter.

Users of this manual are expected to have a background in electronics, including analog and digital circuitry, RF, and microprocessor architectures.

This manual does not include extensive information on the circuit boards that comprise the transmitter assembly. These assemblies are not field repairable and require return to a GE Medical Systems *Information Technologies* service facility for any repairs.

Safety Information

Responsibility of the Manufacturer

GE Medical Systems *Information Technologies* is responsible for the effects of safety, reliability, and performance only if:

- assembly operations, extensions, readjustments, modifications, or repairs are carried out by persons authorized by GE Medical Systems *Information Technologies*;
- the electrical installation of the relevant room complies with the requirements of the appropriate regulations; and
- the device is used in accordance with the instructions for use.

Intended Use

Follow the directives stated below when using any of the transmitters.

- These devices are intended for use under the direct supervision of a licensed health care practitioner.
- These devices are not intended for home use.
- Federal law restricts these devices to be sold by or on the order of a physician.
- Contact GE Medical Systems *Information Technologies* for information before connecting any devices to the equipment that are not recommended in this manual.
- Parts and accessories used must meet the requirements of the applicable IEC 60601 series safety standards, and/or the system configuration must meet the requirements of the IEC 60601-1-1 medical electrical systems standard.
- Periodically, and whenever the integrity of the device is in doubt, test all functions.
- The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:
  - use of the accessory in the PATIENT VICINITY; and
  - evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 60601-1 and/or IEC 60601-1-1 harmonized national standard.
- If the installation of the equipment, in the USA, uses 240V rather than 120V, the source must be a center-tapped, 240V, single-phase circuit.

Equipment Symbols

The following symbols appear on the transmitter.

ATTENTION: Consult accompanying documents before using the equipment.

Medical Equipment
With respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1, and CAN/CSA C22.2 NO. 601.1.

Warnings, Cautions, and Notes

Warnings, cautions, and notes are used throughout this manual to designate a degree or level of hazardous situations. Hazard is defined as a source of potential injury to a person.

WARNING
indicates a potential hazard or unsafe practice which, if not avoided, could result in death or serious injury.

CAUTION
indicates a potential hazard or unsafe practice which, if not avoided, could result in minor personal injury or product/property damage.

NOTE
provides application tips or other useful information to assure that you get the most from your equipment.

Service Information

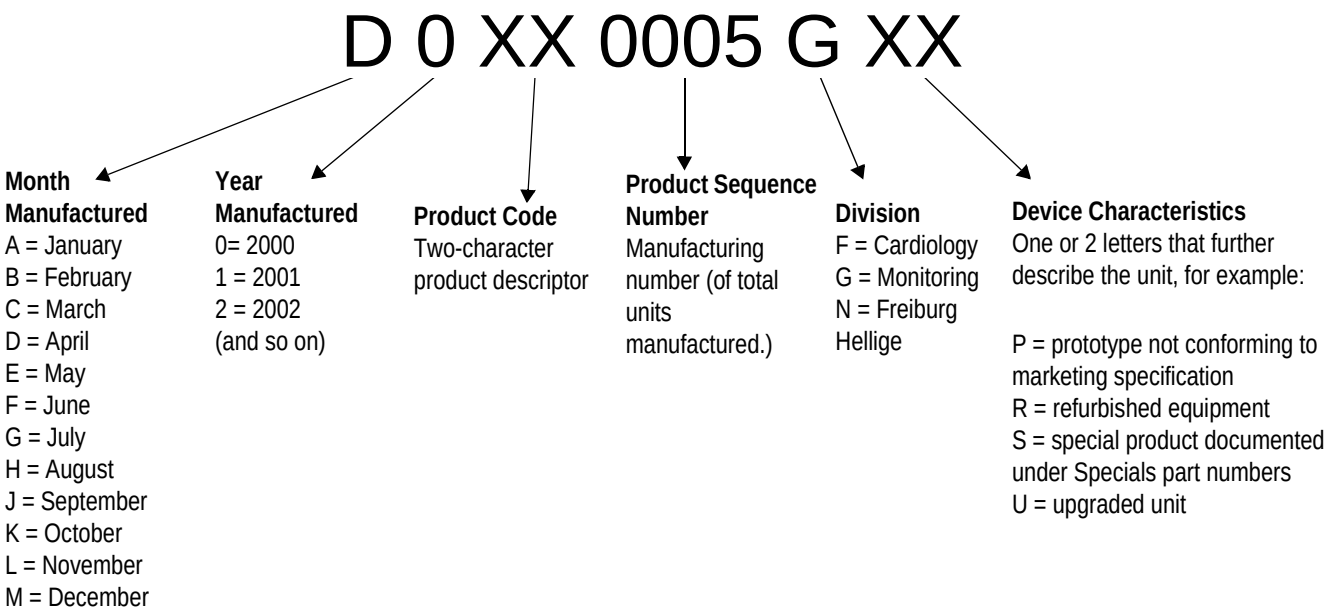
Service Requirements

Follow the service requirements listed below.

- Refer equipment servicing to GE Medical Systems *Information Technologies*' authorized service personnel only.
- Any unauthorized attempt to repair equipment under warranty voids that warranty.
- It is the user's responsibility to report the need for service to GE Medical Systems *Information Technologies* or to one of their authorized agents.
- Failure on the part of the responsible individual, hospital, or institution using this equipment to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards.
- Regular maintenance, irrespective of usage, is essential to ensure that the equipment will always be functional when required.

Equipment Identification

Every GE Medical Systems *Information Technologies* device has a unique serial number for identification. The serial number appears on the product label on the base of each unit.



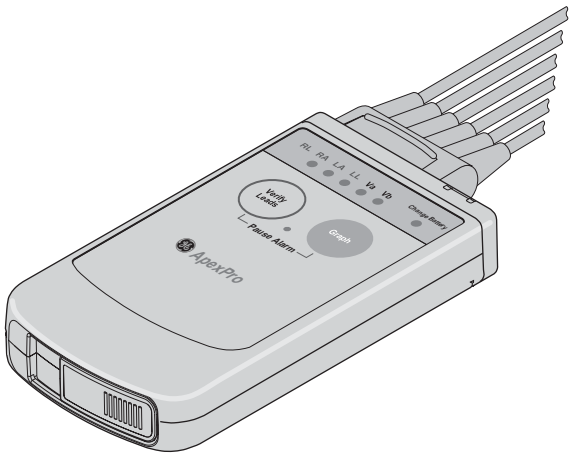
2 Equipment Overview

For your notes

ApexPro Transmitters

The ApexPro transmitter sends the patient's ECG data to the ApexPro receiver system for processing. Data is then transmitted via a dedicated Ethernet interface to the Clinical Information Center (CIC) for viewing. The transmitter can also send DINAMAP® PRO data to the CIC via the DinaLink™ cable.

Additionally, the ApexPro transmitter can send the patient's SpO_2 and noninvasive blood pressure data when the interface connector ports are enabled and when the optional oximeter and/or Accutracker DX noninvasive blood pressure monitor are connected to it.



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CAUTION

UNINTENTIONAL RADIO FREQUENCY (RF) INTERFERENCE — Unintentional RF interference could degrade the reliability and performance of the wireless data link. The facility must maintain an RF environment free from unintentional interference.

Configurations

ApexPro transmitters have one of the following configurations. These configurations are indicated by the labels next to the interface connector ports at the top of the transmitter and by the color of the interface connector port dust covers.

Transmitter Feature Configuration	Transmitter Appearance
Single Lead ECG[1] INACTIVE interface connector ports[2]	**Single Lead** label. Blue interface connector port dust covers and label. 001A
Single Lead ECG[1] ACTIVE interface connector ports[3] [4]	**Single Lead** label. Gray interface connector port dust covers.
Multi-Lead ECG[4] ACTIVE interface connector ports[3] [4]	No labels. Gray interface connector port dust covers.

1. Single Lead ECGs may be acquired using a 3-, 5-, or 6- lead Multi-Link leadwire set. However, only a Single Lead ECG is transmitted or processed.

2. Interface connector ports are active for service use only.

3. Interface connector ports are for connecting serial interface devices.

4. This is a purchased option.

ApexPro Transmitter Battery Installation

Install 2 new AA alkaline batteries in the transmitter.

1. Locate the battery cover at the bottom of the transmitter.
2. Slide the cover over to open the battery compartment.
3. Insert batteries, being careful to follow the polarity signs embossed on the lower back side of the transmitter.
4. Close the battery cover.

NOTE

When the **Change Battery** LED starts flashing, the ApexPro transmitter has approximately one hour of reserve power before the unit shuts down.

Battery Functional Life

The ApexPro transmitter runs on 2 AA batteries. Battery life is approximately 40 hours.

For optimum performance, follow these guidelines:

- Install 2 new alkaline batteries each time you begin monitoring a new patient.
- Install 2 new alkaline batteries whenever the **Change Battery** LED on the ApexPro transmitter is flashing.
- Do not use rechargeable batteries.
- Always change both batteries at the same time.
- Always use new batteries.

CAUTION

GE Medical Systems *Information Technologies* recommends that you always replace both batteries at the same time. Re-using old batteries or using a combination of old and new batteries in the ApexPro transmitter will compromise functionality of the transmitter and increase the risk of fire hazard.

ApexPro Transmitter Controls and Indicators

Start Up

At power up, the transmitter LEDs flash during the start up sequence. After a number of quick flashes, there are 2 long flashes to indicate that the software is running. On the first long flash, all LEDs illuminate. On the second long flash, the **RA** and **Change Battery** LEDs may or may not illuminate, depending on the transmitter's configuration. Use the following table to determine the transmitter's features.

Transmitter Configuration	Start Up LED Sequence
Single Lead ECG INACTIVE interface connector ports	All LEDs, except **Change Battery** and **RA**, light on second flash.
Single Lead ECG ACTIVE interface connector ports	All LEDs, except **RA** light on second flash.
Multi-Lead ECG ACTIVE interface connector ports	All LEDs light on second flash.

- **Verify Leads.** Pressing the **Verify Leads** button enables the good lead LEDs. After pressing this button, the LEDs for good leads illuminate for one minute. If your transmitter is configured for single lead only, the LEDs for connected inactive leads flash for one minute.
- **Graph**. Pressing the **Graph** button initiates printing a 20-second graph strip to the writer or printer.
- Dust Covers. The ApexPro transmitter has 2 dust covers, used when the **INTFC** (interface) connectors are not being used.

- **Pause Alarms** LED. To pause the alarms for five minutes, press both transmitter buttons simultaneously. The **Pause Alarm** LED flashes. "*ALARM PAUSE*" also displays in the patient's waveform window on the Clinical Information Center screen. After five minutes (default), the LED on the transmitter no longer flashes and alarms are reactivated. To reactivate the alarms before the five minute time period has elapsed, press both transmitter buttons simultaneously again.
- **Change Battery** LED.The **Change Battery** LED flashes when battery power is running low. Change the batteries in the ApexPro transmitter.

See the ApexPro Telemetry System Operator's Manual for further details on transmitter operation and leadwire installation.

Interface Connector Ports

The interface connector ports are used to connect the transmitter to the APEX Programming Device. The TTX number and desired reference lead are programmed using the APEX Programming Device.These interface connector ports may also be used to connect additional parameter devices to the ApexPro transmitter.

Transmitter Versions

There are three versions of the ApexPro transmitter assembly.

Upper Level Part Number	Frequency Type	Frequency Range
418500-001	UHF for U.S.	584 – 613.975 MHz
418500-003	UHF for International	420 – 460 MHz
418500-005	UHF for Japan	420 – 460 MHz

PT Series Transmitters

The PT series transmitter is available in Japan only. It is a narrow channel UHF transmitter that accepts one optical port device and a 3-leadwire set. The PT series transmitter is available in three configurations:

- 2110 monitors ECG only
- 2210 monitors ECG and respiration
- 2310 monitors ECG, respiration, and SpO_2

Respiration is measured by impedance using the lead set, or by temperature using an additional thermistor placed in the patient's nose. SpO_2 is acquired via an external probe that connects to a special SpO_2port on the transmitter.

The PT series transmitter acquires a patient's ECG, converts it to 11-bit resolution digital data, and serially broadcasts that information along with pace, respiration waveform, SpO_2 waveform and saturation, additional parameters (from a device attached to the optical port), and status in an RF signal. The transmitter has an on/off switch and an LCD display that indicates its status.

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DINAMAP® PRO Series Monitors

The DINAMAP PRO 100, 200, 300, and 400 series monitors can be connected to the ApexPro transmitter using the DinaLink™ serial cable to monitor SpO_2, NBP, and temperature. Parameter data from the PRO 100–400 series monitors is displayed, trended, and stored at the CIC.

The DinaLink interface cable assembly consists of a monitor adapter cable, the DinaLink adapter, and an interconnection cable. It connects the ApexPro transmitter to the PRO 100–400 series monitors and provids electrical isolation. The interconnect cable connects to either of the optional interface ports on the ApexPro transmitter.

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SpO_2 Oximeter Modules

The oximeter is an optional module that, when connected to the ApexPro transmitter, allows telemetry monitoring of a patient's pulse oximetry data. The oximeter must be connected to an ApexPro transmitter in order to convey SpO_2 data to the Clinical Information Center (CIC). Only digital data is available; no waveforms are generated or transmitted.

310C

NOTE

The ApexPro telemetry system supports two SpO_2 oximeter modules:

- Apex Oximeter
- Nonin Xpod Oximeter

Apex Oximeter

The Apex Oximeter uses 2 AA batteries. Battery life is approximately 60 hours. When the digital displays on the Apex Oximeter start flashing, the Apex Oximeter has approximately one hour of reserve power left before the unit shuts down.

Apex Oximeter Battery Installation

1. Locate the battery cover at the bottom of the back of the Apex Oximeter.
2. Press the latch tab and lift up to open the battery compartment.
3. Install 2 new AA alkaline batteries, being careful to follow the polarity signs located within the battery compartment.
4. Close the battery cover.

Battery Functional Life

For optimum performance, follow these guidelines:

- Install 2 new alkaline batteries each time you begin monitoring a new patient.
- Install 2 new alkaline batteries whenever the digital display on the Apex Oximeter start flashing.
- Always change both batteries at the same time.
- Always use new batteries.

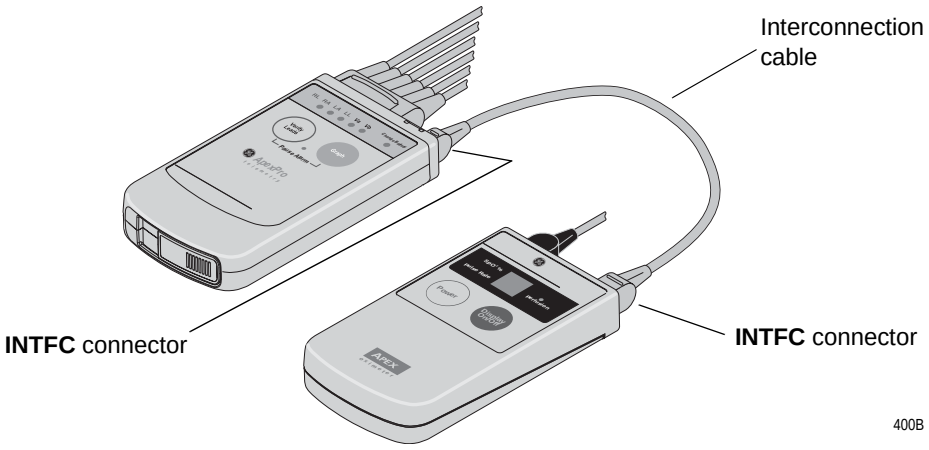
CAUTION
GE Medical Systems *Information Technologies* recommends that you always replace both batteries at the same time. Re-using old batteries or using a combination of old and new batteries in the Apex Oximeter will compromise functionality of the transmitter and increase the risk of fire hazard.

Apex Oximeter Connections

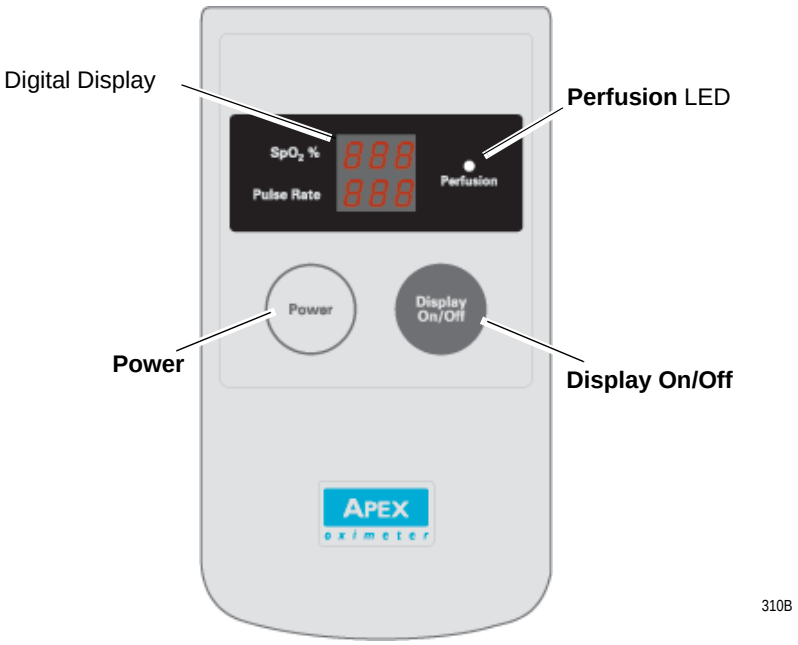
To function correctly, the Apex Oximeter must be connected to a pulse oximetry (SpO_2) probe. To transmit data to the Clinical Information Center, the Apex Oximeter must also be connected to the ApexPro transmitter.

CAUTION
Use only Nonin SpO_2 probes with the oximeter. The reliability of SpO_2 data obtained with any other probe has not been verified.

When properly interconnected, the Apex Oximeter and the ApexPro transmitter should appear similar to the illustration below.



Apex Oximeter Controls and Indicators



- **Power**. Pressing the **Power** button turns on battery power to the Apex Oximeter. This is indicated by the flashing Power LED (horizontal bar). To turn off all power to the Apex Oximeter, press and hold the **Power** button for 2 seconds.
- Digital Display. The display turns on for a one minute when the Apex Oximeter is first powered up and displays oxygen saturation and pulse rate. After one minute the display turns off, but power to the oximeter remains, indicated by the flashing power LED in the upper left corner of the display.
- **Display On/Off**. Press the **Display On/Off** button to turn the display on for one minute. To turn the display on continuously, press and hold the **Display On/Off** button for 2 seconds. The power LED on the digital display turns off to indicate continuous mode.Turn the display off at any time by pressing the **Display On/Off** button again.

  NOTE

  Using the Apex Oximeter with the display on continuously will result in reduced battery life.

- **Perfusion** LED. The perfusion LED indicates the strength of the patient's SpO_2 signal.
  - Green indicates acceptable strength pulse.
  - Yellow indicates a SpO_2 signals of marginal quality.
  - Red indicates the SpO_2 signals is weak or the quality is very poor.

  NOTE

  When the digital displays on the Apex Oximeter start flashing, the Apex Oximeter has approximately one hour of reserve power left before the unit shuts down.

Nonin Xpod Oximeter

Indicators/Display

The oximeter does not have indicators such as digital displays or LEDs. All information displays at the Clinical Information Center.

Power

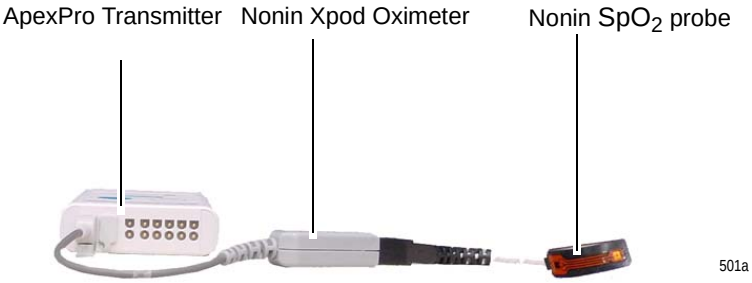
The oximeter draws power from the ApexPro transmitter. The oximeter only functions when connected to the SpO_2 probe and the ApexPro transmitter. The expected life of fully-charged batteries in the ApexPro transmitter reduces to 30 hours if an oximeter is connected to it.

Nonin Xpod Oximeter Connections

To function correctly, the oximeter must be connected to a pulse oximetry (SpO_2) probe and to the ApexPro transmitter.

CAUTION
Use only Nonin SpO_2 probes with the oximeter. The reliability of SpO_2 data obtained with any other probe has not been verified.

When properly interconnected, the ApexPro transmitter, the Nonin Xpod oximeter, and the Nonin SpO_2 probe appears similar to the illustration below.



To connect the transmitter, the oximeter, and the probe:

1. Connect the SpO_2 probe to the oximeter by plugging the non-sensor end of the probe into the 8-pin connector of the oximeter.
2. Connect the oximeter to the transmitter by plugging the 5-pin connector of the oximeter to the 5-pin connector labeled **INTFC 1** on the transmitter

Accutracker DX Noninvasive Blood Pressure (NBP) Monitor

NOTE

The Accutracker DX noninvasive blood pressure monitor is available in the United States only. This model, available from GE is modified by SunTech Medical Instruments to operate with the ApexPro Telemetry System.

The Accutracker DX noninvasive blood pressure monitor is an optional module that, when connected to the ApexPro transmitter, allows telemetry monitoring of a patient's NBP data. Digital values display at the Clinical Information Center (CIC) and are stored in Graphic Trends and Vital Signs on the CIC.

Battery Installation

1. Locate the battery cover on the back of the blood pressure monitor.
2. Press down and gently slide off the cover.
3. Remove the old batteries by lifting up on the ribbon in the battery case. Dispose of the old batteries properly, following your local ordinances.
4. Install 4 new AA alkaline batteries, being careful to follow the polarity signs. Be sure to place the batteries on top of the ribbon.
5. Slide the battery cover back on securely.

NOTE

When the *Low Batt* message displays on the Accutracker, change the batteries.

Accutracker DX Functional Life

IMPORTANT

Store and use the Accutracker DX blood pressure monitor with 4 good AA batteries installed. For long-term storage, install new batteries and replace them every 4 months.

The Accutracker DX blood pressure monitor contains an internal lithium battery capable of sustaining the Accutracker for a **maximum** of 9 months (6400 hours) without AA batteries installed. If the lithium battery becomes fully discharged, the Accutracker must be returned to the factory for service. To extend the life of the lithium battery, always store the Accutracker DX with 4 good AA batteries installed.

NOTE

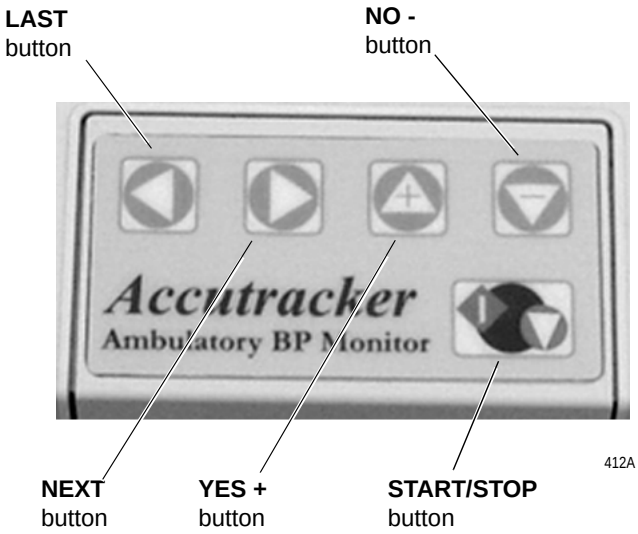
This is a **cumulative** 9-month period, spanning the entire life of the blood pressure monitor.

If the lithium battery is completely drained, the unit will not function. The internal lithium battery is **not** user replaceable. The unit must be returned for service if the lithium battery needs to be replaced.

GE recommends that the lithium battery be serviced every three to five years.

The 4 AA batteries last for approximately 250 blood pressure readings, taken at an average interval of 15 minutes.

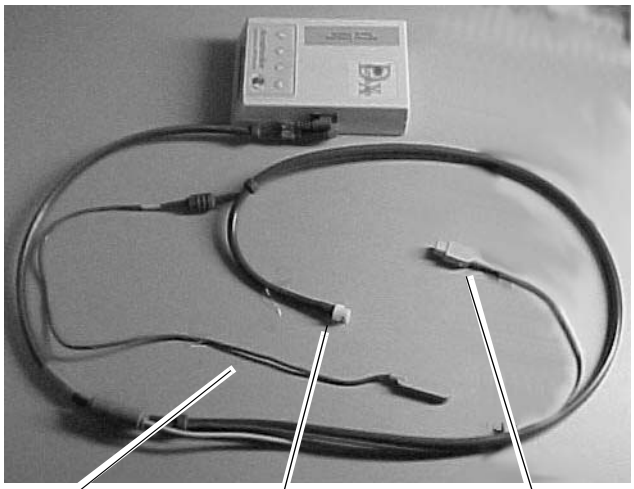
Accutracker DX Controls and Indicators



- On/Off Switch. Labeled **1/0** it turns main power on and off.
- **START/STOP.** Starts and stops blood pressure readings.
- **NEXT.** Moves forward to the next menu item on the monitor display.
- **LAST.** Moves back to the previous menu item on the monitor display.
- **YES +.** Allows a yes response to a question or an increase in the value shown.
- **NO -.** Allows a no response to a question or a decrease in the value shown.

Accutracker DX Connections

The patient cable, microphone cable, and interconnection cable attach to one another in one assembly. Refer to the illustrations below.



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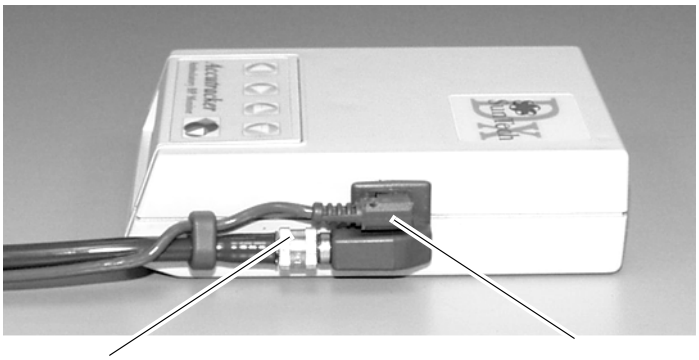

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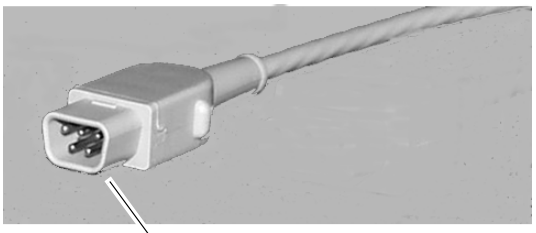
Interconnection Cables

Apex Oximeter and Accutracker DX

The interconnection cable used to connect the ApexPro transmitter with the Apex Oximeter and/or the Accutracker DX blood pressure monitor, and/or the DinaLink serial cable is shown below.

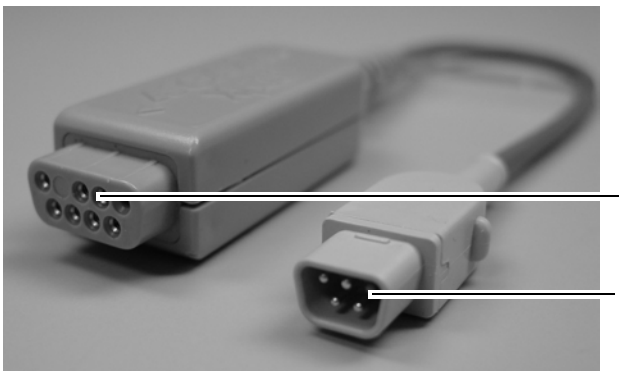


423B

ApexPro telemetry system interconnection cable connector — plugs into the ApexPro transmitter.

Nonin Xpod Oximeter

The interconnection cables used to connect the ApexPro transmitter and the SpO_2 probe are a part of the oximeter module. The figure below shows the difference in connector ends for the oximeter.



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Oximeter connector- plugs into the Nonin SpO_2 probe.

Oximeter connector- plugs into the ApexPro transmitter.

Technical Specifications

Below are the technical specifications for the ApexPro telemetry system. Due to continual product innovation, GE Medical Systems *Information Technologies* designs and specifications are subject to change without notice. Contact your sales/service office for the most current information.

ApexPro Transmitter

Performance Specification

Battery

Battery type:	ANSI/NEDA 15A, 1.5 V AA alkaline (2 req.)
Battery life:	40 hours typical
Polarity:	Electronic reverse polarity protection
Static withstand:	meets and exceeds IEC 801-2 second edition
Shock withstand:	5 random drops from 4 ft on to tiled concrete floor
Water resistance:	IEC 529 IPX3 rating
Cleaning/Sterilization:	Isopropyl alcohol, ammonia (diluted), Cidex, sodium hypochlorite bleach (diluted) or mild soap (diluted).

Alarms Control

Battery integrity:	Transmitted and indicated via LED
Lead fail indication:	Transmitted and indicated via LED
Alarm Pause:	Transmitted and indicated via LED
Graph request:	Transmitted
Power on/off:	Battery insertion/removal

Transmission

Channel spacing:	25 kHz
Frequency stability:	± 0.0001% of assigned channel frequency
Modulation:	GMSK
Bit rate:	10 kb/sec
Antenna:	Formed by leadwire shield
Frequency range:	420–460 MHz, 560.025–590 MHz, or 584–613.975 MHz (programmable synthesizer) Note: The frequency range depends on the PCB installed.
Power output:	0.64mW @ 420–460 MHz 0.5mW @ 560.025–590 MHz, or 584–613.975 MHz (programmable synthesizer) (Meets FCC requirements Parts 95 and 15.242)

Multi-channel (5- or 6-leadwire) configuration:	I, II, III, Va, Vb, aVR, aVL, aVF
Leads analyzed simultaneously:	Four (I, II, III and V)[1]
Single-channel (3-leadwire) configuration:	I, II or III, programmable
Heart rate detection range:	30 to 300 beats/minute
QRS detection range:	0.5 to 5 mV
Frequency response:	0.05 Hz to 40 Hz (–3dB)
Dynamic range:	± 5 mV (RTI)
Input offset:	± 300 mV (RTI)
Input impedance:	15 Megohm min differential at 10 Hz
ECG gain selection:	5, 10, 20, 40 mm/mV (RTI)
Gain accuracy:	± 5% at 15 Hz
Common mode rejection:	100 dB min at 60 Hz
Lead fail detection:	DC type; indicates leadwire failed (i.e., RA, LA, LL, Va, or Vb)
Pacemaker detection:	± 2 mV to ± 700 mV (RTI); 100 µsec to 2 msec; either polarity
Defibrillator protection:	± 5000 VDC, 360 joules into 100 ohm load
Defibrillation recovery time:	Defibrillation recovery time: Limited only by electrode recovery time. Transmitter recovers within 2 sec.

1. Transmitters configured for single lead only can only analyze one lead.

Analog/Digital

A/D converter resolution:	10 bits, 9.76 µV (RTI)
Sample rate:	240 samples/sec
Serial communications:	2 – 9600 baud asynchronous[1]

1. Does not apply to units configured with inactive interface connector ports.

Environmental Specifications

Operating Conditions

Ambient temperature:	0°C to 50°C (32°F to 122°F)
Relative humidity:	5% to 95% (noncondensing)

Storage Conditions

Temperature:	–40°C to 70°C (–40°F to 158°F)
Relative humidity:	30% to 95% (noncondensing)
Pressure:	700 hPa to 1060 hPa

Physical Specifications

Height:	13.7 cm (5.4 in)
Width:	7.3 cm (2.9 in)
Depth:	2.3 cm (0.9 in)
Weight:	141.8 g (5 oz) Weight excludes batteries and leadwire assembly.
Certification	420-460 MHz 560.025 – 613.975 MHz – FCC Part 15 CE Marking

Electromagnetic Compatibility Compliance

Radiated RF Immunity Verification Results

The ApexPro telemetry system meets the requirements of EN60601-1-2 (1993-04) Medical Electrical Equipment, Part 1: General Requirements for Safety, 2. Collateral Standard: Electromagnetic compatibility – Requirements and tests, with the following exceptions.

NOTE

This data was collected December 6 - 8, 1999.

Exceptions:

EN60601-1-2 Second Edition Draft 200X-YY clause 2.210 Exclusion bands for intentional radiating/receiving devices = +/- 5% of frequency or frequency band.

EN60601-1-2 Second Edition Draft 200X-YY clause 36.202.3 - a - 4 – Radiated RF Electromagnetic fields Immunity - Exclusion Band

EN60601-1-2 Second Edition Draft 200X-YY clause 36.202.6 - a - 4 – Conducted RF Electromagnetic fields Immunity - Exclusion Band

- The antenna system tested operates in a frequency band of 560 - 614 MHz. The allowable exclusion band would then be 532 - 645 MHz. The level of compliance is not 1 V/m in the ranges of 520 - 534 MHz and 645 - 660 MHz.
- The transmitter tested operates at a frequency of 614 MHz. The allowable exclusion band would then be 583 - 645 MHz. The level of compliance is 1 V/m.

If operating under the conditions defined in EMC Standard EN60601-1-2 (Radiated Immunity 3 V/m), field strengths above 1 V/m may cause waveform distortions and erroneous numeric data at various electromagnetic interference (EMI) frequencies.

Recommendations:

- Review the AAMI EMC Committee technical information report (TIR-18) titled Guidance on electromagnetic compatibility of medical devices for clinical/biomedical engineers - Part 1: Radiated radio-frequency electromagnetic energy. This TIR provides a means to evaluate and manage the EMI environment in the hospital.
- The following actions can be taken:
  - Manage (increase) distance between sources of EMI and susceptible devices.
  - Manage (remove) devices that are highly susceptible to EMI.
  - Reduce power from internal EMI sources under hospital control (i.e., paging systems).
  - Label devices susceptible to EMI.
  - Educate staff (nurses and doctors) to be aware of and to recognize potential EMI-related problems.

FCC Compliance Information Statement

This device complies with Part 15 of the FCC Rules and with RSS-210 of Industry Canada.

Operation is subject to the following 2 conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

WARNING

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Apex Oximeter

Performance Specifications

Battery Type:	ANSI/NEDA 15A, 1.5V AA alkaline (2 required)
Battery Life:	30 hrs. typical with display on continuously; 60 hrs. typical with display off
Polarity:	Electronic reverse polarity protection
Static withstand:	Meets and exceeds IEC 802.2 second edition
Shock withstand:	5 random drops from 4 ft onto tiled concrete floor
Water resistant with sensor in place:	
Cleaning/Sterilization:	Isopropyl alcohol, ammonia (diluted), Cidex, sodium hypochlorite bleach (diluted) or mild soap (diluted)

Controls and Indicators

Power on/off:	Button switch
Display on/off:	Button switch
LED indicator:	Numerical SpO_2 value; numerical HR value; signal quality indicator
SpO_2 sensors:	Full line of Nonin qualified reusable and disposable sensors

Processing

Saturation range:	0 to 100%
Saturation accuracy:	70 to 100% ± 3 digits (± 1 S.D.)
Pulse rate range:	18 to 300 BPM
Pulse rate accuracy:	± 3 % or 1 BPM, whichever is greater

Clinical Information Center

Messages:	Check probe, Low signal quality, Probe off patient
Numerical display:	SpO_2 (% value), HR (bpm)
Alarms:	SpO_2 high/low, HR high/low

Physical Specifications

Height:	12.7 cm (5.0 in)
Depth:	2.0 cm (0.8 in)
Width:	6.9 cm (2.7 in)
Weight:	113.4 g (4.0 oz) Weight excludes batteries and SpO_2 probe

Certification

UL 2601-1 CE marking for the 93/42/EEC Medical Device Directive.

The Apex Oximeter is manufactured for GE by Nonin Medical, Inc. It is recommended for use with Nonin sensors only.

Nonin Xpod Oximeter

Performance Specifications

Static withstand:	Meets and exceeds IEC 802.2 second edition
Shock withstand:	5 random drops from 4 ft onto tiled concrete floor
Water resistant with sensor in place:	
Cleaning/Sterilization:	Isopropyl alcohol, ammonia (diluted), Cidex, sodium hypochlorite bleach (diluted) or mild soap (diluted)

Controls and Indicators

SpO_2 sensors:	Full line of Nonin qualified reusable and disposable sensors

Processing

Saturation range:	0 to 100%
Saturation accuracy:	70 to 100% ± 2 digits (± 1 S.D.) for adults using the Finger Clip Sensor 70 to 100% ± 3 digits (± 1 S.D.) for adults using the Flex or Reflectance Sensors 70 to 100% ± 4 digits (± 1 S.D.) using the Ear Clip Sensor 70 to 95% ± 3 digits (± 1 S.D.) for neonates using the Infant or Neonatal Sensors
Pulse rate range:	18 to 300 BPM
Pulse rate accuracy:	± 3 % or ± 1 digit whichever is greater

Clinical Information Center

Messages:	Check probe, Low signal quality, Probe off patient
Numerical display:	SpO_2 (% value), HR (bpm)
Alarms:	SpO_2 high/low, HR high/low

Physical Specifications

Height:	5.3 cm (2.1 in)
Depth:	2.0 cm (0.8 in)
Width:	1.5 cm (0.6 in)
Weight:	60.0 g (2.1 oz) including 1.8 m (6.0 ft) of cable and connector

Certification

UL 2601-1 CE marking for the 93/42/EEC Medical Device Directive.

The Nonin Xpod oximeter is manufactured for GE by Nonin Medical, Inc. It is recommended for use with Nonin sensors only.

Accutracker DX Noninvasive Blood Pressure Monitor

Performance Specifications

Technique:	Ausculatory. Diastolic pressure is determined from Phase 5 Korotkoff sounds.
Accuracy:	Blood pressure measurements determined with this device are equivalent to those obtained by a trained observer using the cuff/stethoscope auscultation method, within the limits prescribed by the American National Standard, Electronic or automated sphygmomanometers.
Pressure:	Dynamic or fixed programmable. Dynamic pressure configuration maximizes patient comfort by limiting cuff inflation to 30 mmHg greater than the previous systolic pressure, without exceeding configurable limits.
Pressure Range:	0 to 250 mmHg
Maximum pressure programmable limits:	100 to 250 mmHg, increments of 10 mmHg
Minimum pressure programmable limits:	10 to 100 mmHg, increments of 10 mmHg
Auto retry:	Automatically initiates an additional reading in the event a reading fails to satisfy any of the programmable criteria.

Blood Pressure Range

*Contact technical support for information on setting these limits.

Systolic:	10 to 250 mmHg
Upper auto-retry programmable limits:	50 to 240 mmHg, increments of 10 mmHg*
Lower auto-retry programmable limits:	50 to 150 mmHg, increments of 10 mmHg*
Systolic change (delta) limits:	30 to 100 mmHg, increments of 10 mmHg*
Diastolic:	10 to 250 mmHg
Upper auto-retry programmable limits:	50 to 150 mmHg, increments of 10 mmHg*
Lower auto-retry programmable limits:	30 to 100 mmHg, increments of 10 mmHg*
Diastolic change (delta) limits:	20 to 100 mmHg, increments of 10 mmHg*

Pulse Pressure

Upper auto-retry programmable limits:	40 to 150 mmHg, increments of 10 mmHg*
Lower auto-retry programmable limits:	10 to 100 mmHg, increments of 10 mmHg*
Pulse pressure change (delta) limits:	30 to 100 mmHg, increments of 10 mmHg*
Deflation rate:	True linear deflation according to AHA guidelines. Programmable for 2, 3, 4, 5, or 6 mmHg per second.
Display:	32 character LCD (16 characters per row) provides a clear view of data and message prompts.
Sample quantity:	Over 250 samples per set of 4 new batteries.
Sample periods:	Manual and interval programmable. Intervals of 5, 6, 7, 8, 9, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60, 90, 120 or 240 minutes can be selected/programmed.

Start key:	Allows the patient or caregiver to initiate readings on demand.
Power source:	Four 1.5 (AA) alkaline batteries. Rechargeable batteries are not recommended (sample quantity with rechargeable batteries typically limited to 25 samples/ measurements vs. 250 samples/measurements with new alkaline batteries).

Environmental Specifications

Operating temperature:	+10°C to 40°C (50°F to 104°F)
Relative Humidity:	<95%
Storage temperature:	-20°C to +50°C (-4°F to +122°F)
Relative Humidity:	<95%
Power:	6 Vdc, four 1.5V “AA” Alkaline batteries.

Physical Specifications

Length:	12.7 cm (5.0 in)
Width:	8.25 cm (3.25 in)
Thickness:	3.3 cm (1.30 in)
Weight:	357.2 g (12.6 oz)

Certification

UL2601

Electromagnetic Compatibility Compliance

The Accutracker DX noninvasive blood pressure monitor complies with EN60601-1-2 (1993-04) Medical Electrical Equipment, Part 1: General Requirements for Safety, 2. Collateral Standard: Electromagnetic compatibility - Requirements and tests.

Exception:

IEC 60601-1-2 clause 36.202.1 - Immunity: ESD

- The level of compliance is ± 2, 4, 6 kV Contact discharge and ± 2, 4, 6 kV Air discharge.

Air discharges of ± 8 kV or greater may cause the cuff to deflate and the unit to lock up. By turning the power switch off, then back on (manual reset), the unit will be restored to the user-defined settings and normal operation.

Recommendations:

- The Accutracker DX blood pressure monitor should be kept in the carrying pouch supplied with each unit.
- Care should be taken to minimize the ESD potential when the Accutracker DX blood pressure monitor is removed from the pouch. This includes:
  - Handling the unit in an ESD-protected area.
  - Maintaining humidity levels of 50% relative humidity or greater.
  - Discharging ESD potential on human hands prior to handling the unit out of the pouch.

Underwriters Laboratories, Inc.

4P41

Medical Equipment
With respect to electric shock, fire and mechanical hazards only in accordance with UL 2601-1, and CAN/CSA C22.2 NO. 601.1.

3 Installation

For your notes

Programming the Transmitter for Use

Before use, the ApexPro transmitter must be programmed using the ApexPro Program Device Kit (PN 421733-001 or 421733-002). The ApexPro transmitter is programmed or upgraded in the field to:

- select the operating frequency
- select the reference lead
- set alarm pause time
- enable the Multi-Lead ECG option
- enable the interface connector ports

This section contains TTX Frequency Charts listing the operating frequencies and the corresponding TTX ID numbers.

To program the transmitter, a personal computer (IBM-compatible) running Windows NT 4.0 or Windows 95 is required. Included with the ApexPro Program Device Kit is a disk containing software that is loaded onto the personal computer and executed.

Also included with the kit are the APEX and ApexPro Telemetry System Programming Device Service Instructions, (PN 2001989-011 or 2001989-099) which provide detailed instructions about programming the ApexPro transmitter.

Accutracker Calibration

GE recommends performing the “Accutracker DX NIBP Operational Tests” on page 4-20“ of the Maintenance chapter, when you receive the Accutracker and every 12 months thereafter. If the unit fails, return the unit to GE Medical Systems *Information Technologies* Service and Supplies. See “How to Reach Us” included in the front of this publication.

400MHz TTX Frequency Chart

Frequency (MHz) = ((TTX – 1000)* 0.025) + 420

TTX ID	Freq (MHz)	Xmtr Label	TTX # (prog. box)	Note
1000	420.000	TTX 1000AP (1000)	1000	Reserved
1001	420.025	TTX 1001AP (1001)	1001	
1002	420.050	TTX 1002AP (1002)	1002	
1003	420.075	TTX 1003AP (1003)	1003	
1004	420.100	TTX 1004AP (1004)	1004	
1005	420.125	TTX 1005AP (1005)	1005	
1006	420.150	TTX 1006AP (1006)	1006	
1007	420.175	TTX 1007AP (1007)	1007	
1008	420.200	TTX 1008AP (1008)	1008	
1009	420.225	TTX 1009AP (1009)	1009	
1010	420.250	TTX 1010AP (1010)	1010	
1011	420.275	TTX 1011AP (1011)	1011	
1012	420.300	TTX 1012AP (1012)	1012	
1013	420.325	TTX 1013AP (1013)	1013	
1014	420.350	TTX 1014AP (1014)	1014	
1015	420.375	TTX 1015AP (1015)	1015	
1016	420.400	TTX 1016AP (1016)	1016	
1017	420.425	TTX 1017AP (1017)	1017	
1018	420.450	TTX 1018AP (1018)	1018	
1019	420.475	TTX 1019AP (1019)	1019	
1020	420.500	TTX 1020AP (1020)	1020	
1021	420.525	TTX 1021AP (1021)	1021	
1022	420.550	TTX 1022AP (1022)	1022	
1023	420.575	TTX 1023AP (1023)	1023	
1024	420.600	TTX 1024AP (1024)	1024	
1025	420.625	TTX 1025AP (1025)	1025	
1026	420.650	TTX 1026AP (1026)	1026	
1027	420.675	TTX 1027AP (1027)	1027	
1028	420.700	TTX 1028AP (1028)	1028	
1029	420.725	TTX 1029AP (1029)	1029	
1030	420.750	TTX 1030AP (1030)	1030	
1031	420.775	TTX 1031AP (1031)	1031	
1032	420.800	TTX 1032AP (1032)	1032	
1033	420.825	TTX 1033AP (1033)	1033	
1034	420.850	TTX 1034AP (1034)	1034	
1035	420.875	TTX 1035AP (1035)	1035	
1036	420.900	TTX 1036AP (1036)	1036	
1037	420.925	TTX 1037AP (1037)	1037	
1038	420.950	TTX 1038AP (1038)	1038	
1039	420.975	TTX 1039AP (1039)	1039	
1040	421.000	TTX 1040AP (1040)	1040	
1041	421.025	TTX 1041AP (1041)	1041	
1042	421.050	TTX 1042AP (1042)	1042	
1043	421.075	TTX 1043AP (1043)	1043	
1044	421.100	TTX 1044AP (1044)	1044	
1045	421.125	TTX 1045AP (1045)	1045	
1046	421.150	TTX 1046AP (1046)	1046	

TTX ID	Freq (MHz)	Xmtr Label	TTX # (prog. box)	Note
1047	421.175	TTX 1047AP (1047)	1047	
1048	421.200	TTX 1048AP (1048)	1048	
1049	421.225	TTX 1049AP (1049)	1049	
1050	421.250	TTX 1050AP (1050)	1050	
1051	421.275	TTX 1051AP (1051)	1051	
1052	421.300	TTX 1052AP (1052)	1052	
1053	421.325	TTX 1053AP (1053)	1053	
1054	421.350	TTX 1054AP (1054)	1054	
1055	421.375	TTX 1055AP (1055)	1055	
1056	421.400	TTX 1056AP (1056)	1056	
1057	421.425	TTX 1057AP (1057)	1057	
1058	421.450	TTX 1058AP (1058)	1058	
1059	421.475	TTX 1059AP (1059)	1059	
1060	421.500	TTX 1060AP (1060)	1060	
1061	421.525	TTX 1061AP (1061)	1061	
1062	421.550	TTX 1062AP (1062)	1062	
1063	421.575	TTX 1063AP (1063)	1063	
1064	421.600	TTX 1064AP (1064)	1064	
1065	421.625	TTX 1065AP (1065)	1065	
1066	421.650	TTX 1066AP (1066)	1066	
1067	421.675	TTX 1067AP (1067)	1067	
1068	421.700	TTX 1068AP (1068)	1068	
1069	421.725	TTX 1069AP (1069)	1069	
1070	421.750	TTX 1070AP (1070)	1070	
1071	421.775	TTX 1071AP (1071)	1071	
1072	421.800	TTX 1072AP (1072)	1072	
1073	421.825	TTX 1073AP (1073)	1073	
1074	421.850	TTX 1074AP (1074)	1074	
1075	421.875	TTX 1075AP (1075)	1075	
1076	421.900	TTX 1076AP (1076)	1076	
1077	421.925	TTX 1077AP (1077)	1077	
1078	421.950	TTX 1078AP (1078)	1078	
1079	421.975	TTX 1079AP (1079)	1079	
1080	422.000	TTX 1080AP (1080)	1080	
1081	422.025	TTX 1081AP (1081)	1081	
1082	422.050	TTX 1082AP (1082)	1082	
1083	422.075	TTX 1083AP (1083)	1083	
1084	422.100	TTX 1084AP (1084)	1084	
1085	422.125	TTX 1085AP (1085)	1085	
1086	422.150	TTX 1086AP (1086)	1086	
1087	422.175	TTX 1087AP (1087)	1087	
1088	422.200	TTX 1088AP (1088)	1088	
1089	422.225	TTX 1089AP (1089)	1089	
1090	422.250	TTX 1090AP (1090)	1090	
1091	422.275	TTX 1091AP (1091)	1091	
1092	422.300	TTX 1092AP (1092)	1092	
1093	422.325	TTX 1093AP (1093)	1093	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1094	422.350	TTX 1094AP (1094)	1094	
1095	422.375	TTX 1095AP (1095)	1095	
1096	422.400	TTX 1096AP (1096)	1096	
1097	422.425	TTX 1097AP (1097)	1097	
1098	422.450	TTX 1098AP (1098)	1098	
1099	422.475	TTX 1099AP (1099)	1099	
1100	422.500	TTX 1100AP (1100)	1100	
1101	422.525	TTX 1101AP (1101)	1101	
1102	422.550	TTX 1102AP (1102)	1102	
1103	422.575	TTX 1103AP (1103)	1103	
1104	422.600	TTX 1104AP (1104)	1104	
1105	422.625	TTX 1105AP (1105)	1105	
1106	422.650	TTX 1106AP (1106)	1106	
1107	422.675	TTX 1107AP (1107)	1107	
1108	422.700	TTX 1108AP (1108)	1108	
1109	422.725	TTX 1109AP (1109)	1109	
1110	422.750	TTX 1110AP (1110)	1110	
1111	422.775	TTX 1111AP (1111)	1111	
1112	422.800	TTX 1112AP (1112)	1112	
1113	422.825	TTX 1113AP (1113)	1113	
1114	422.850	TTX 1114AP (1114)	1114	
1115	422.875	TTX 1115AP (1115)	1115	
1116	422.900	TTX 1116AP (1116)	1116	
1117	422.925	TTX 1117AP (1117)	1117	
1118	422.950	TTX 1118AP (1118)	1118	
1119	422.975	TTX 1119AP (1119)	1119	
1120	423.000	TTX 1120AP (1120)	1120	
1121	423.025	TTX 1121AP (1121)	1121	
1122	423.050	TTX 1122AP (1122)	1122	
1123	423.075	TTX 1123AP (1123)	1123	
1124	423.100	TTX 1124AP (1124)	1124	
1125	423.125	TTX 1125AP (1125)	1125	
1126	423.150	TTX 1126AP (1126)	1126	
1127	423.175	TTX 1127AP (1127)	1127	
1128	423.200	TTX 1128AP (1128)	1128	
1129	423.225	TTX 1129AP (1129)	1129	
1130	423.250	TTX 1130AP (1130)	1130	
1131	423.275	TTX 1131AP (1131)	1131	
1132	423.300	TTX 1132AP (1132)	1132	
1133	423.325	TTX 1133AP (1133)	1133	
1134	423.350	TTX 1134AP (1134)	1134	
1135	423.375	TTX 1135AP (1135)	1135	
1136	423.400	TTX 1136AP (1136)	1136	
1137	423.425	TTX 1137AP (1137)	1137	
1138	423.450	TTX 1138AP (1138)	1138	
1139	423.475	TTX 1139AP (1139)	1139	
1140	423.500	TTX 1140AP (1140)	1140	
1141	423.525	TTX 1141AP (1141)	1141	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1142	423.550	TTX 1142AP (1142)	1142	
1143	423.575	TTX 1143AP (1143)	1143	
1144	423.600	TTX 1144AP (1144)	1144	
1145	423.625	TTX 1145AP (1145)	1145	
1146	423.650	TTX 1146AP (1146)	1146	
1147	423.675	TTX 1147AP (1147)	1147	
1148	423.700	TTX 1148AP (1148)	1148	
1149	423.725	TTX 1149AP (1149)	1149	
1150	423.750	TTX 1150AP (1150)	1150	
1151	423.775	TTX 1151AP (1151)	1151	
1152	423.800	TTX 1152AP (1152)	1152	
1153	423.825	TTX 1153AP (1153)	1153	
1154	423.850	TTX 1154AP (1154)	1154	
1155	423.875	TTX 1155AP (1155)	1155	
1156	423.900	TTX 1156AP (1156)	1156	
1157	423.925	TTX 1157AP (1157)	1157	
1158	423.950	TTX 1158AP (1158)	1158	
1159	423.975	TTX 1159AP (1159)	1159	
1160	424.000	TTX 1160AP (1160)	1160	
1161	424.025	TTX 1161AP (1161)	1161	
1162	424.050	TTX 1162AP (1162)	1162	
1163	424.075	TTX 1163AP (1163)	1163	
1164	424.100	TTX 1164AP (1164)	1164	
1165	424.125	TTX 1165AP (1165)	1165	
1166	424.150	TTX 1166AP (1166)	1166	
1167	424.175	TTX 1167AP (1167)	1167	
1168	424.200	TTX 1168AP (1168)	1168	
1169	424.225	TTX 1169AP (1169)	1169	
1170	424.250	TTX 1170AP (1170)	1170	
1171	424.275	TTX 1171AP (1171)	1171	
1172	424.300	TTX 1172AP (1172)	1172	
1173	424.325	TTX 1173AP (1173)	1173	
1174	424.350	TTX 1174AP (1174)	1174	
1175	424.375	TTX 1175AP (1175)	1175	
1176	424.400	TTX 1176AP (1176)	1176	
1177	424.425	TTX 1177AP (1177)	1177	
1178	424.450	TTX 1178AP (1178)	1178	
1179	424.475	TTX 1179AP (1179)	1179	
1180	424.500	TTX 1180AP (1180)	1180	
1181	424.525	TTX 1181AP (1181)	1181	
1182	424.550	TTX 1182AP (1182)	1182	
1183	424.575	TTX 1183AP (1183)	1183	
1184	424.600	TTX 1184AP (1184)	1184	
1185	424.625	TTX 1185AP (1185)	1185	
1186	424.650	TTX 1186AP (1186)	1186	
1187	424.675	TTX 1187AP (1187)	1187	
1188	424.700	TTX 1188AP (1188)	1188	
1189	424.725	TTX 1189AP (1189)	1189	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1190	424.750	TTX 1190AP (1190)	1190	
1191	424.775	TTX 1191AP (1191)	1191	
1192	424.800	TTX 1192AP (1192)	1192	
1193	424.825	TTX 1193AP (1193)	1193	
1194	424.850	TTX 1194AP (1194)	1194	
1195	424.875	TTX 1195AP (1195)	1195	
1196	424.900	TTX 1196AP (1196)	1196	
1197	424.925	TTX 1197AP (1197)	1197	
1198	424.950	TTX 1198AP (1198)	1198	
1199	424.975	TTX 1199AP (1199)	1199	
1200	425.000	TTX 1200AP (1200)	1200	
1201	425.025	TTX 1201AP (1201)	1201	
1202	425.050	TTX 1202AP (1202)	1202	
1203	425.075	TTX 1203AP (1203)	1203	
1204	425.100	TTX 1204AP (1204)	1204	
1205	425.125	TTX 1205AP (1205)	1205	
1206	425.150	TTX 1206AP (1206)	1206	
1207	425.175	TTX 1207AP (1207)	1207	
1208	425.200	TTX 1208AP (1208)	1208	
1209	425.225	TTX 1209AP (1209)	1209	
1210	425.250	TTX 1210AP (1210)	1210	
1211	425.275	TTX 1211AP (1211)	1211	
1212	425.300	TTX 1212AP (1212)	1212	
1213	425.325	TTX 1213AP (1213)	1213	
1214	425.350	TTX 1214AP (1214)	1214	
1215	425.375	TTX 1215AP (1215)	1215	
1216	425.400	TTX 1216AP (1216)	1216	
1217	425.425	TTX 1217AP (1217)	1217	
1218	425.450	TTX 1218AP (1218)	1218	
1219	425.475	TTX 1219AP (1219)	1219	
1220	425.500	TTX 1220AP (1220)	1220	
1221	425.525	TTX 1221AP (1221)	1221	
1222	425.550	TTX 1222AP (1222)	1222	
1223	425.575	TTX 1223AP (1223)	1223	
1224	425.600	TTX 1224AP (1224)	1224	
1225	425.625	TTX 1225AP (1225)	1225	
1226	425.650	TTX 1226AP (1226)	1226	
1227	425.675	TTX 1227AP (1227)	1227	
1228	425.700	TTX 1228AP (1228)	1228	
1229	425.725	TTX 1229AP (1229)	1229	
1230	425.750	TTX 1230AP (1230)	1230	
1231	425.775	TTX 1231AP (1231)	1231	
1232	425.800	TTX 1232AP (1232)	1232	
1233	425.825	TTX 1233AP (1233)	1233	
1234	425.850	TTX 1234AP (1234)	1234	
1235	425.875	TTX 1235AP (1235)	1235	
1236	425.900	TTX 1236AP (1236)	1236	
1237	425.925	TTX 1237AP (1237)	1237	
1238	425.950	TTX 1238AP (1238)	1238	
1239	425.975	TTX 1239AP (1239)	1239	
1240	426.000	TTX 1240AP (1240)	1240	Reserved
1241	426.025	TTX 1241AP (1241)	1241	
1242	426.050	TTX 1242AP (1242)	1242	
1243	426.075	TTX 1243AP (1243)	1243	
1244	426.100	TTX 1244AP (1244)	1244	
1245	426.125	TTX 1245AP (1245)	1245	
1246	426.150	TTX 1246AP (1246)	1246	
1247	426.175	TTX 1247AP (1247)	1247	
1248	426.200	TTX 1248AP (1248)	1248	
1249	426.225	TTX 1249AP (1249)	1249	
1250	426.250	TTX 1250AP (1250)	1250	
1251	426.275	TTX 1251AP (1251)	1251	
1252	426.300	TTX 1252AP (1252)	1252	
1253	426.325	TTX 1253AP (1253)	1253	
1254	426.350	TTX 1254AP (1254)	1254	
1255	426.375	TTX 1255AP (1255)	1255	
1256	426.400	TTX 1256AP (1256)	1256	
1257	426.425	TTX 1257AP (1257)	1257	
1258	426.450	TTX 1258AP (1258)	1258	
1259	426.475	TTX 1259AP (1259)	1259	
1260	426.500	TTX 1260AP (1260)	1260	
1261	426.525	TTX 1261AP (1261)	1261	
1262	426.550	TTX 1262AP (1262)	1262	
1263	426.575	TTX 1263AP (1263)	1263	
1264	426.600	TTX 1264AP (1264)	1264	
1265	426.625	TTX 1265AP (1265)	1265	
1266	426.650	TTX 1266AP (1266)	1266	
1267	426.675	TTX 1267AP (1267)	1267	
1268	426.700	TTX 1268AP (1268)	1268	
1269	426.725	TTX 1269AP (1269)	1269	
1270	426.750	TTX 1270AP (1270)	1270	
1271	426.775	TTX 1271AP (1271)	1271	
1272	426.800	TTX 1272AP (1272)	1272	
1273	426.825	TTX 1273AP (1273)	1273	
1274	426.850	TTX 1274AP (1274)	1274	
1275	426.875	TTX 1275AP (1275)	1275	
1276	426.900	TTX 1276AP (1276)	1276	
1277	426.925	TTX 1277AP (1277)	1277	
1278	426.950	TTX 1278AP (1278)	1278	
1279	426.975	TTX 1279AP (1279)	1279	
1280	427.000	TTX 1280AP (1280)	1280	
1281	427.025	TTX 1281AP (1281)	1281	
1282	427.050	TTX 1282AP (1282)	1282	
1283	427.075	TTX 1283AP (1283)	1283	
1284	427.100	TTX 1284AP (1284)	1284	
1285	427.125	TTX 1285AP (1285)	1285	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1286	427.150	TTX 1286AP (1286)	1286	
1287	427.175	TTX 1287AP (1287)	1287	
1288	427.200	TTX 1288AP (1288)	1288	
1289	427.225	TTX 1289AP (1289)	1289	
1290	427.250	TTX 1290AP (1290)	1290	
1291	427.275	TTX 1291AP (1291)	1291	
1292	427.300	TTX 1292AP (1292)	1292	
1293	427.325	TTX 1293AP (1293)	1293	
1294	427.350	TTX 1294AP (1294)	1294	
1295	427.375	TTX 1295AP (1295)	1295	
1296	427.400	TTX 1296AP (1296)	1296	
1297	427.425	TTX 1297AP (1297)	1297	
1298	427.450	TTX 1298AP (1298)	1298	
1299	427.475	TTX 1299AP (1299)	1299	
1300	427.500	TTX 1300AP (1300)	1300	
1301	427.525	TTX 1301AP (1301)	1301	
1302	427.550	TTX 1302AP (1302)	1302	
1303	427.575	TTX 1303AP (1303)	1303	
1304	427.600	TTX 1304AP (1304)	1304	
1305	427.625	TTX 1305AP (1305)	1305	
1306	427.650	TTX 1306AP (1306)	1306	
1307	427.675	TTX 1307AP (1307)	1307	
1308	427.700	TTX 1308AP (1308)	1308	
1309	427.725	TTX 1309AP (1309)	1309	
1310	427.750	TTX 1310AP (1310)	1310	
1311	427.775	TTX 1311AP (1311)	1311	
1312	427.800	TTX 1312AP (1312)	1312	
1313	427.825	TTX 1313AP (1313)	1313	
1314	427.850	TTX 1314AP (1314)	1314	
1315	427.875	TTX 1315AP (1315)	1315	
1316	427.900	TTX 1316AP (1316)	1316	
1317	427.925	TTX 1317AP (1317)	1317	
1318	427.950	TTX 1318AP (1318)	1318	
1319	427.975	TTX 1319AP (1319)	1319	
1320	428.000	TTX 1320AP (1320)	1320	
1321	428.025	TTX 1321AP (1321)	1321	
1322	428.050	TTX 1322AP (1322)	1322	
1323	428.075	TTX 1323AP (1323)	1323	
1324	428.100	TTX 1324AP (1324)	1324	
1325	428.125	TTX 1325AP (1325)	1325	
1326	428.150	TTX 1326AP (1326)	1326	
1327	428.175	TTX 1327AP (1327)	1327	
1328	428.200	TTX 1328AP (1328)	1328	
1329	428.225	TTX 1329AP (1329)	1329	
1330	428.250	TTX 1330AP (1330)	1330	
1331	428.275	TTX 1331AP (1331)	1331	
1332	428.300	TTX 1332AP (1332)	1332	
1333	428.325	TTX 1333AP (1333)	1333	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1334	428.350	TTX 1334AP (1334)	1334	
1335	428.375	TTX 1335AP (1335)	1335	
1336	428.400	TTX 1336AP (1336)	1336	
1337	428.425	TTX 1337AP (1337)	1337	
1338	428.450	TTX 1338AP (1338)	1338	
1339	428.475	TTX 1339AP (1339)	1339	
1340	428.500	TTX 1340AP (1340)	1340	
1341	428.525	TTX 1341AP (1341)	1341	
1342	428.550	TTX 1342AP (1342)	1342	
1343	428.575	TTX 1343AP (1343)	1343	
1344	428.600	TTX 1344AP (1344)	1344	
1345	428.625	TTX 1345AP (1345)	1345	
1346	428.650	TTX 1346AP (1346)	1346	
1347	428.675	TTX 1347AP (1347)	1347	
1348	428.700	TTX 1348AP (1348)	1348	
1349	428.725	TTX 1349AP (1349)	1349	
1350	428.750	TTX 1350AP (1350)	1350	
1351	428.775	TTX 1351AP (1351)	1351	
1352	428.800	TTX 1352AP (1352)	1352	
1353	428.825	TTX 1353AP (1353)	1353	
1354	428.850	TTX 1354AP (1354)	1354	
1355	428.875	TTX 1355AP (1355)	1355	
1356	428.900	TTX 1356AP (1356)	1356	
1357	428.925	TTX 1357AP (1357)	1357	
1358	428.950	TTX 1358AP (1358)	1358	
1359	428.975	TTX 1359AP (1359)	1359	
1360	429.000	TTX 1360AP (1360)	1360	
1361	429.025	TTX 1361AP (1361)	1361	
1362	429.050	TTX 1362AP (1362)	1362	
1363	429.075	TTX 1363AP (1363)	1363	
1364	429.100	TTX 1364AP (1364)	1364	
1365	429.125	TTX 1365AP (1365)	1365	
1366	429.150	TTX 1366AP (1366)	1366	
1367	429.175	TTX 1367AP (1367)	1367	
1368	429.200	TTX 1368AP (1368)	1368	
1369	429.225	TTX 1369AP (1369)	1369	
1370	429.250	TTX 1370AP (1370)	1370	
1371	429.275	TTX 1371AP (1371)	1371	
1372	429.300	TTX 1372AP (1372)	1372	
1373	429.325	TTX 1373AP (1373)	1373	
1374	429.350	TTX 1374AP (1374)	1374	
1375	429.375	TTX 1375AP (1375)	1375	
1376	429.400	TTX 1376AP (1376)	1376	
1377	429.425	TTX 1377AP (1377)	1377	
1378	429.450	TTX 1378AP (1378)	1378	
1379	429.475	TTX 1379AP (1379)	1379	
1380	429.500	TTX 1380AP (1380)	1380	
1381	429.525	TTX 1381AP (1381)	1381	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1382	429.550	TTX 1382AP (1382)	1382	
1383	429.575	TTX 1383AP (1383)	1383	
1384	429.600	TTX 1384AP (1384)	1384	
1385	429.625	TTX 1385AP (1385)	1385	
1386	429.650	TTX 1386AP (1386)	1386	
1387	429.675	TTX 1387AP (1387)	1387	
1388	429.700	TTX 1388AP (1388)	1388	
1389	429.725	TTX 1389AP (1389)	1389	
1390	429.750	TTX 1390AP (1390)	1390	
1391	429.775	TTX 1391AP (1391)	1391	
1392	429.800	TTX 1392AP (1392)	1392	
1393	429.825	TTX 1393AP (1393)	1393	
1394	429.850	TTX 1394AP (1394)	1394	
1395	429.875	TTX 1395AP (1395)	1395	
1396	429.900	TTX 1396AP (1396)	1396	
1397	429.925	TTX 1397AP (1397)	1397	
1398	429.950	TTX 1398AP (1398)	1398	
1399	429.975	TTX 1399AP (1399)	1399	
1400	430.000	TTX 1400AP (1400)	1400	
1401	430.025	TTX 1401AP (1401)	1401	
1402	430.050	TTX 1402AP (1402)	1402	
1403	430.075	TTX 1403AP (1403)	1403	
1404	430.100	TTX 1404AP (1404)	1404	
1405	430.125	TTX 1405AP (1405)	1405	
1406	430.150	TTX 1406AP (1406)	1406	
1407	430.175	TTX 1407AP (1407)	1407	
1408	430.200	TTX 1408AP (1408)	1408	
1409	430.225	TTX 1409AP (1409)	1409	
1410	430.250	TTX 1410AP (1410)	1410	
1411	430.275	TTX 1411AP (1411)	1411	
1412	430.300	TTX 1412AP (1412)	1412	
1413	430.325	TTX 1413AP (1413)	1413	
1414	430.350	TTX 1414AP (1414)	1414	
1415	430.375	TTX 1415AP (1415)	1415	
1416	430.400	TTX 1416AP (1416)	1416	
1417	430.425	TTX 1417AP (1417)	1417	
1418	430.450	TTX 1418AP (1418)	1418	
1419	430.475	TTX 1419AP (1419)	1419	
1420	430.500	TTX 1420AP (1420)	1420	
1421	430.525	TTX 1421AP (1421)	1421	
1422	430.550	TTX 1422AP (1422)	1422	
1423	430.575	TTX 1423AP (1423)	1423	
1424	430.600	TTX 1424AP (1424)	1424	
1425	430.625	TTX 1425AP (1425)	1425	
1426	430.650	TTX 1426AP (1426)	1426	
1427	430.675	TTX 1427AP (1427)	1427	
1428	430.700	TTX 1428AP (1428)	1428	
1429	430.725	TTX 1429AP (1429)	1429	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1430	430.750	TTX 1430AP (1430)	1430	
1431	430.775	TTX 1431AP (1431)	1431	
1432	430.800	TTX 1432AP (1432)	1432	
1433	430.825	TTX 1433AP (1433)	1433	
1434	430.850	TTX 1434AP (1434)	1434	
1435	430.875	TTX 1435AP (1435)	1435	
1436	430.900	TTX 1436AP (1436)	1436	
1437	430.925	TTX 1437AP (1437)	1437	
1438	430.950	TTX 1438AP (1438)	1438	
1439	430.975	TTX 1439AP (1439)	1439	
1440	431.000	TTX 1440AP (1440)	1440	
1441	431.025	TTX 1441AP (1441)	1441	
1442	431.050	TTX 1442AP (1442)	1442	
1443	431.075	TTX 1443AP (1443)	1443	
1444	431.100	TTX 1444AP (1444)	1444	
1445	431.125	TTX 1445AP (1445)	1445	
1446	431.150	TTX 1446AP (1446)	1446	
1447	431.175	TTX 1447AP (1447)	1447	
1448	431.200	TTX 1448AP (1448)	1448	
1449	431.225	TTX 1449AP (1449)	1449	
1450	431.250	TTX 1450AP (1450)	1450	
1451	431.275	TTX 1451AP (1451)	1451	
1452	431.300	TTX 1452AP (1452)	1452	
1453	431.325	TTX 1453AP (1453)	1453	
1454	431.350	TTX 1454AP (1454)	1454	
1455	431.375	TTX 1455AP (1455)	1455	
1456	431.400	TTX 1456AP (1456)	1456	
1457	431.425	TTX 1457AP (1457)	1457	
1458	431.450	TTX 1458AP (1458)	1458	
1459	431.475	TTX 1459AP (1459)	1459	
1460	431.500	TTX 1460AP (1460)	1460	
1461	431.525	TTX 1461AP (1461)	1461	
1462	431.550	TTX 1462AP (1462)	1462	
1463	431.575	TTX 1463AP (1463)	1463	
1464	431.600	TTX 1464AP (1464)	1464	
1465	431.625	TTX 1465AP (1465)	1465	
1466	431.650	TTX 1466AP (1466)	1466	
1467	431.675	TTX 1467AP (1467)	1467	
1468	431.700	TTX 1468AP (1468)	1468	
1469	431.725	TTX 1469AP (1469)	1469	
1470	431.750	TTX 1470AP (1470)	1470	
1471	431.775	TTX 1471AP (1471)	1471	
1472	431.800	TTX 1472AP (1472)	1472	
1473	431.825	TTX 1473AP (1473)	1473	
1474	431.850	TTX 1474AP (1474)	1474	
1475	431.875	TTX 1475AP (1475)	1475	
1476	431.900	TTX 1476AP (1476)	1476	
1477	431.925	TTX 1477AP (1477)	1477	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1478	431.950	TTX 1478AP (1478)	1478	
1479	431.975	TTX 1479AP (1479)	1479	
1480	432.000	TTX 1480AP (1480)	1480	Reserved
1481	432.025	TTX 1481AP (1481)	1481	
1482	432.050	TTX 1482AP (1482)	1482	
1483	432.075	TTX 1483AP (1483)	1483	
1484	432.100	TTX 1484AP (1484)	1484	
1485	432.125	TTX 1485AP (1485)	1485	
1486	432.150	TTX 1486AP (1486)	1486	
1487	432.175	TTX 1487AP (1487)	1487	
1488	432.200	TTX 1488AP (1488)	1488	
1489	432.225	TTX 1489AP (1489)	1489	
1490	432.250	TTX 1490AP (1490)	1490	
1491	432.275	TTX 1491AP (1491)	1491	
1492	432.300	TTX 1492AP (1492)	1492	
1493	432.325	TTX 1493AP (1493)	1493	
1494	432.350	TTX 1494AP (1494)	1494	
1495	432.375	TTX 1495AP (1495)	1495	
1496	432.400	TTX 1496AP (1496)	1496	
1497	432.425	TTX 1497AP (1497)	1497	
1498	432.450	TTX 1498AP (1498)	1498	
1499	432.475	TTX 1499AP (1499)	1499	
1500	432.500	TTX 1500AP (1500)	1500	
1501	432.525	TTX 1501AP (1501)	1501	
1502	432.550	TTX 1502AP (1502)	1502	
1503	432.575	TTX 1503AP (1503)	1503	
1504	432.600	TTX 1504AP (1504)	1504	
1505	432.625	TTX 1505AP (1505)	1505	
1506	432.650	TTX 1506AP (1506)	1506	
1507	432.675	TTX 1507AP (1507)	1507	
1508	432.700	TTX 1508AP (1508)	1508	
1509	432.725	TTX 1509AP (1509)	1509	
1510	432.750	TTX 1510AP (1510)	1510	
1511	432.775	TTX 1511AP (1511)	1511	
1512	432.800	TTX 1512AP (1512)	1512	
1513	432.825	TTX 1513AP (1513)	1513	
1514	432.850	TTX 1514AP (1514)	1514	
1515	432.875	TTX 1515AP (1515)	1515	
1516	432.900	TTX 1516AP (1516)	1516	
1517	432.925	TTX 1517AP (1517)	1517	
1518	432.950	TTX 1518AP (1518)	1518	
1519	432.975	TTX 1519AP (1519)	1519	
1520	433.000	TTX 1520AP (1520)	1520	
1521	433.025	TTX 1521AP (1521)	1521	
1522	433.050	TTX 1522AP (1522)	1522	
1523	433.075	TTX 1523AP (1523)	1523	
1524	433.100	TTX 1524AP (1524)	1524	
1525	433.125	TTX 1525AP (1525)	1525	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1526	433.150	TTX 1526AP (1526)	1526	
1527	433.175	TTX 1527AP (1527)	1527	
1528	433.200	TTX 1528AP (1528)	1528	
1529	433.225	TTX 1529AP (1529)	1529	
1530	433.250	TTX 1530AP (1530)	1530	
1531	433.275	TTX 1531AP (1531)	1531	
1532	433.300	TTX 1532AP (1532)	1532	
1533	433.325	TTX 1533AP (1533)	1533	
1534	433.350	TTX 1534AP (1534)	1534	
1535	433.375	TTX 1535AP (1535)	1535	
1536	433.400	TTX 1536AP (1536)	1536	
1537	433.425	TTX 1537AP (1537)	1537	
1538	433.450	TTX 1538AP (1538)	1538	
1539	433.475	TTX 1539AP (1539)	1539	
1540	433.500	TTX 1540AP (1540)	1540	
1541	433.525	TTX 1541AP (1541)	1541	
1542	433.550	TTX 1542AP (1542)	1542	
1543	433.575	TTX 1543AP (1543)	1543	
1544	433.600	TTX 1544AP (1544)	1544	
1545	433.625	TTX 1545AP (1545)	1545	
1546	433.650	TTX 1546AP (1546)	1546	
1547	433.675	TTX 1547AP (1547)	1547	
1548	433.700	TTX 1548AP (1548)	1548	
1549	433.725	TTX 1549AP (1549)	1549	
1550	433.750	TTX 1550AP (1550)	1550	
1551	433.775	TTX 1551AP (1551)	1551	
1552	433.800	TTX 1552AP (1552)	1552	
1553	433.825	TTX 1553AP (1553)	1553	
1554	433.850	TTX 1554AP (1554)	1554	
1555	433.875	TTX 1555AP (1555)	1555	
1556	433.900	TTX 1556AP (1556)	1556	
1557	433.925	TTX 1557AP (1557)	1557	
1558	433.950	TTX 1558AP (1558)	1558	
1559	433.975	TTX 1559AP (1559)	1559	
1560	434.000	TTX 1560AP (1560)	1560	
1561	434.025	TTX 1561AP (1561)	1561	
1562	434.050	TTX 1562AP (1562)	1562	
1563	434.075	TTX 1563AP (1563)	1563	
1564	434.100	TTX 1564AP (1564)	1564	
1565	434.125	TTX 1565AP (1565)	1565	
1566	434.150	TTX 1566AP (1566)	1566	
1567	434.175	TTX 1567AP (1567)	1567	
1568	434.200	TTX 1568AP (1568)	1568	
1569	434.225	TTX 1569AP (1569)	1569	
1570	434.250	TTX 1570AP (1570)	1570	
1571	434.275	TTX 1571AP (1571)	1571	
1572	434.300	TTX 1572AP (1572)	1572	
1573	434.325	TTX 1573AP (1573)	1573	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1574	434.350	TTX 1574AP (1574)	1574	
1575	434.375	TTX 1575AP (1575)	1575	
1576	434.400	TTX 1576AP (1576)	1576	
1577	434.425	TTX 1577AP (1577)	1577	
1578	434.450	TTX 1578AP (1578)	1578	
1579	434.475	TTX 1579AP (1579)	1579	
1580	434.500	TTX 1580AP (1580)	1580	
1581	434.525	TTX 1581AP (1581)	1581	
1582	434.550	TTX 1582AP (1582)	1582	
1583	434.575	TTX 1583AP (1583)	1583	
1584	434.600	TTX 1584AP (1584)	1584	
1585	434.625	TTX 1585AP (1585)	1585	
1586	434.650	TTX 1586AP (1586)	1586	
1587	434.675	TTX 1587AP (1587)	1587	
1588	434.700	TTX 1588AP (1588)	1588	
1589	434.725	TTX 1589AP (1589)	1589	
1590	434.750	TTX 1590AP (1590)	1590	
1591	434.775	TTX 1591AP (1591)	1591	
1592	434.800	TTX 1592AP (1592)	1592	
1593	434.825	TTX 1593AP (1593)	1593	
1594	434.850	TTX 1594AP (1594)	1594	
1595	434.875	TTX 1595AP (1595)	1595	
1596	434.900	TTX 1596AP (1596)	1596	
1597	434.925	TTX 1597AP (1597)	1597	
1598	434.950	TTX 1598AP (1598)	1598	
1599	434.975	TTX 1599AP (1599)	1599	
1600	435.000	TTX 1600AP (1600)	1600	
1601	435.025	TTX 1601AP (1601)	1601	
1602	435.050	TTX 1602AP (1602)	1602	
1603	435.075	TTX 1603AP (1603)	1603	
1604	435.100	TTX 1604AP (1604)	1604	
1605	435.125	TTX 1605AP (1605)	1605	
1606	435.150	TTX 1606AP (1606)	1606	
1607	435.175	TTX 1607AP (1607)	1607	
1608	435.200	TTX 1608AP (1608)	1608	
1609	435.225	TTX 1609AP (1609)	1609	
1610	435.250	TTX 1610AP (1610)	1610	
1611	435.275	TTX 1611AP (1611)	1611	
1612	435.300	TTX 1612AP (1612)	1612	
1613	435.325	TTX 1613AP (1613)	1613	
1614	435.350	TTX 1614AP (1614)	1614	
1615	435.375	TTX 1615AP (1615)	1615	
1616	435.400	TTX 1616AP (1616)	1616	
1617	435.425	TTX 1617AP (1617)	1617	
1618	435.450	TTX 1618AP (1618)	1618	
1619	435.475	TTX 1619AP (1619)	1619	
1620	435.500	TTX 1620AP (1620)	1620	
1621	435.525	TTX 1621AP (1621)	1621	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1622	435.550	TTX 1622AP (1622)	1622	
1623	435.575	TTX 1623AP (1623)	1623	
1624	435.600	TTX 1624AP (1624)	1624	
1625	435.625	TTX 1625AP (1625)	1625	
1626	435.650	TTX 1626AP (1626)	1626	
1627	435.675	TTX 1627AP (1627)	1627	
1628	435.700	TTX 1628AP (1628)	1628	
1629	435.725	TTX 1629AP (1629)	1629	
1630	435.750	TTX 1630AP (1630)	1630	
1631	435.775	TTX 1631AP (1631)	1631	
1632	435.800	TTX 1632AP (1632)	1632	
1633	435.825	TTX 1633AP (1633)	1633	
1634	435.850	TTX 1634AP (1634)	1634	
1635	435.875	TTX 1635AP (1635)	1635	
1636	435.900	TTX 1636AP (1636)	1636	
1637	435.925	TTX 1637AP (1637)	1637	
1638	435.950	TTX 1638AP (1638)	1638	
1639	435.975	TTX 1639AP (1639)	1639	
1640	436.000	TTX 1640AP (1640)	1640	
1641	436.025	TTX 1641AP (1641)	1641	
1642	436.050	TTX 1642AP (1642)	1642	
1643	436.075	TTX 1643AP (1643)	1643	
1644	436.100	TTX 1644AP (1644)	1644	
1645	436.125	TTX 1645AP (1645)	1645	
1646	436.150	TTX 1646AP (1646)	1646	
1647	436.175	TTX 1647AP (1647)	1647	
1648	436.200	TTX 1648AP (1648)	1648	
1649	436.225	TTX 1649AP (1649)	1649	
1650	436.250	TTX 1650AP (1650)	1650	
1651	436.275	TTX 1651AP (1651)	1651	
1652	436.300	TTX 1652AP (1652)	1652	
1653	436.325	TTX 1653AP (1653)	1653	
1654	436.350	TTX 1654AP (1654)	1654	
1655	436.375	TTX 1655AP (1655)	1655	
1656	436.400	TTX 1656AP (1656)	1656	
1657	436.425	TTX 1657AP (1657)	1657	
1658	436.450	TTX 1658AP (1658)	1658	
1659	436.475	TTX 1659AP (1659)	1659	
1660	436.500	TTX 1660AP (1660)	1660	
1661	436.525	TTX 1661AP (1661)	1661	
1662	436.550	TTX 1662AP (1662)	1662	
1663	436.575	TTX 1663AP (1663)	1663	
1664	436.600	TTX 1664AP (1664)	1664	
1665	436.625	TTX 1665AP (1665)	1665	
1666	436.650	TTX 1666AP (1666)	1666	
1667	436.675	TTX 1667AP (1667)	1667	
1668	436.700	TTX 1668AP (1668)	1668	
1669	436.725	TTX 1669AP (1669)	1669	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1670	436.750	TTX 1670AP (1670)	1670	
1671	436.775	TTX 1671AP (1671)	1671	
1672	436.800	TTX 1672AP (1672)	1672	
1673	436.825	TTX 1673AP (1673)	1673	
1674	436.850	TTX 1674AP (1674)	1674	
1675	436.875	TTX 1675AP (1675)	1675	
1676	436.900	TTX 1676AP (1676)	1676	
1677	436.925	TTX 1677AP (1677)	1677	
1678	436.950	TTX 1678AP (1678)	1678	
1679	436.975	TTX 1679AP (1679)	1679	
1680	437.000	TTX 1680AP (1680)	1680	
1681	437.025	TTX 1681AP (1681)	1681	
1682	437.050	TTX 1682AP (1682)	1682	
1683	437.075	TTX 1683AP (1683)	1683	
1684	437.100	TTX 1684AP (1684)	1684	
1685	437.125	TTX 1685AP (1685)	1685	
1686	437.150	TTX 1686AP (1686)	1686	
1687	437.175	TTX 1687AP (1687)	1687	
1688	437.200	TTX 1688AP (1688)	1688	
1689	437.225	TTX 1689AP (1689)	1689	
1690	437.250	TTX 1690AP (1690)	1690	
1691	437.275	TTX 1691AP (1691)	1691	
1692	437.300	TTX 1692AP (1692)	1692	
1693	437.325	TTX 1693AP (1693)	1693	
1694	437.350	TTX 1694AP (1694)	1694	
1695	437.375	TTX 1695AP (1695)	1695	
1696	437.400	TTX 1696AP (1696)	1696	
1697	437.425	TTX 1697AP (1697)	1697	
1698	437.450	TTX 1698AP (1698)	1698	
1699	437.475	TTX 1699AP (1699)	1699	
1700	437.500	TTX 1700AP (1700)	1700	
1701	437.525	TTX 1701AP (1701)	1701	
1702	437.550	TTX 1702AP (1702)	1702	
1703	437.575	TTX 1703AP (1703)	1703	
1704	437.600	TTX 1704AP (1704)	1704	
1705	437.625	TTX 1705AP (1705)	1705	
1706	437.650	TTX 1706AP (1706)	1706	
1707	437.675	TTX 1707AP (1707)	1707	
1708	437.700	TTX 1708AP (1708)	1708	
1709	437.725	TTX 1709AP (1709)	1709	
1710	437.750	TTX 1710AP (1710)	1710	
1711	437.775	TTX 1711AP (1711)	1711	
1712	437.800	TTX 1712AP (1712)	1712	
1713	437.825	TTX 1713AP (1713)	1713	
1714	437.850	TTX 1714AP (1714)	1714	
1715	437.875	TTX 1715AP (1715)	1715	
1716	437.900	TTX 1716AP (1716)	1716	
1717	437.925	TTX 1717AP (1717)	1717	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1718	437.950	TTX 1718AP (1718)	1718	
1719	437.975	TTX 1719AP (1719)	1719	
1720	438.000	TTX 1720AP (1720)	1720	
1721	438.025	TTX 1721AP (1721)	1721	
1722	438.050	TTX 1722AP (1722)	1722	
1723	438.075	TTX 1723AP (1723)	1723	
1724	438.100	TTX 1724AP (1724)	1724	
1725	438.125	TTX 1725AP (1725)	1725	
1726	438.150	TTX 1726AP (1726)	1726	
1727	438.175	TTX 1727AP (1727)	1727	
1728	438.200	TTX 1728AP (1728)	1728	
1729	438.225	TTX 1729AP (1729)	1729	
1730	438.250	TTX 1730AP (1730)	1730	
1731	438.275	TTX 1731AP (1731)	1731	
1732	438.300	TTX 1732AP (1732)	1732	
1733	438.325	TTX 1733AP (1733)	1733	
1734	438.350	TTX 1734AP (1734)	1734	
1735	438.375	TTX 1735AP (1735)	1735	
1736	438.400	TTX 1736AP (1736)	1736	
1737	438.425	TTX 1737AP (1737)	1737	
1738	438.450	TTX 1738AP (1738)	1738	
1739	438.475	TTX 1739AP (1739)	1739	
1740	438.500	TTX 1740AP (1740)	1740	
1741	438.525	TTX 1741AP (1741)	1741	
1742	438.550	TTX 1742AP (1742)	1742	
1743	438.575	TTX 1743AP (1743)	1743	
1744	438.600	TTX 1744AP (1744)	1744	
1745	438.625	TTX 1745AP (1745)	1745	
1746	438.650	TTX 1746AP (1746)	1746	
1747	438.675	TTX 1747AP (1747)	1747	
1748	438.700	TTX 1748AP (1748)	1748	
1749	438.725	TTX 1749AP (1749)	1749	
1750	438.750	TTX 1750AP (1750)	1750	
1751	438.775	TTX 1751AP (1751)	1751	
1752	438.800	TTX 1752AP (1752)	1752	
1753	438.825	TTX 1753AP (1753)	1753	
1754	438.850	TTX 1754AP (1754)	1754	
1755	438.875	TTX 1755AP (1755)	1755	
1756	438.900	TTX 1756AP (1756)	1756	
1757	438.925	TTX 1757AP (1757)	1757	
1758	438.950	TTX 1758AP (1758)	1758	
1759	438.975	TTX 1759AP (1759)	1759	
1760	439.000	TTX 1760AP (1760)	1760	
1761	439.025	TTX 1761AP (1761)	1761	
1762	439.050	TTX 1762AP (1762)	1762	
1763	439.075	TTX 1763AP (1763)	1763	
1764	439.100	TTX 1764AP (1764)	1764	
1765	439.125	TTX 1765AP (1765)	1765	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1766	439.150	TTX 1766AP (1766)	1766	
1767	439.175	TTX 1767AP (1767)	1767	
1768	439.200	TTX 1768AP (1768)	1768	
1769	439.225	TTX 1769AP (1769)	1769	
1770	439.250	TTX 1770AP (1770)	1770	
1771	439.275	TTX 1771AP (1771)	1771	
1772	439.300	TTX 1772AP (1772)	1772	
1773	439.325	TTX 1773AP (1773)	1773	
1774	439.350	TTX 1774AP (1774)	1774	
1775	439.375	TTX 1775AP (1775)	1775	
1776	439.400	TTX 1776AP (1776)	1776	
1777	439.425	TTX 1777AP (1777)	1777	
1778	439.450	TTX 1778AP (1778)	1778	
1779	439.475	TTX 1779AP (1779)	1779	
1780	439.500	TTX 1780AP (1780)	1780	
1781	439.525	TTX 1781AP (1781)	1781	
1782	439.550	TTX 1782AP (1782)	1782	
1783	439.575	TTX 1783AP (1783)	1783	
1784	439.600	TTX 1784AP (1784)	1784	
1785	439.625	TTX 1785AP (1785)	1785	
1786	439.650	TTX 1786AP (1786)	1786	
1787	439.675	TTX 1787AP (1787)	1787	
1788	439.700	TTX 1788AP (1788)	1788	
1789	439.725	TTX 1789AP (1789)	1789	
1790	439.750	TTX 1790AP (1790)	1790	
1791	439.775	TTX 1791AP (1791)	1791	
1792	439.800	TTX 1792AP (1792)	1792	
1793	439.825	TTX 1793AP (1793)	1793	
1794	439.850	TTX 1794AP (1794)	1794	
1795	439.875	TTX 1795AP (1795)	1795	
1796	439.900	TTX 1796AP (1796)	1796	
1797	439.925	TTX 1797AP (1797)	1797	
1798	439.950	TTX 1798AP (1798)	1798	
1799	439.975	TTX 1799AP (1799)	1799	
1800	440.000	TTX 1800AP (1800)	1800	
1801	440.025	TTX 1801AP (1801)	1801	
1802	440.050	TTX 1802AP (1802)	1802	
1803	440.075	TTX 1803AP (1803)	1803	
1804	440.100	TTX 1804AP (1804)	1804	
1805	440.125	TTX 1805AP (1805)	1805	
1806	440.150	TTX 1806AP (1806)	1806	
1807	440.175	TTX 1807AP (1807)	1807	
1808	440.200	TTX 1808AP (1808)	1808	
1809	440.225	TTX 1809AP (1809)	1809	
1810	440.250	TTX 1810AP (1810)	1810	
1811	440.275	TTX 1811AP (1811)	1811	
1812	440.300	TTX 1812AP (1812)	1812	
1813	440.325	TTX 1813AP (1813)	1813	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1814	440.350	TTX 1814AP (1814)	1814	
1815	440.375	TTX 1815AP (1815)	1815	
1816	440.400	TTX 1816AP (1816)	1816	
1817	440.425	TTX 1817AP (1817)	1817	
1818	440.450	TTX 1818AP (1818)	1818	
1819	440.475	TTX 1819AP (1819)	1819	
1820	440.500	TTX 1820AP (1820)	1820	
1821	440.525	TTX 1821AP (1821)	1821	
1822	440.550	TTX 1822AP (1822)	1822	
1823	440.575	TTX 1823AP (1823)	1823	
1824	440.600	TTX 1824AP (1824)	1824	
1825	440.625	TTX 1825AP (1825)	1825	
1826	440.650	TTX 1826AP (1826)	1826	
1827	440.675	TTX 1827AP (1827)	1827	
1828	440.700	TTX 1828AP (1828)	1828	
1829	440.725	TTX 1829AP (1829)	1829	
1830	440.750	TTX 1830AP (1830)	1830	
1831	440.775	TTX 1831AP (1831)	1831	
1832	440.800	TTX 1832AP (1832)	1832	
1833	440.825	TTX 1833AP (1833)	1833	
1834	440.850	TTX 1834AP (1834)	1834	
1835	440.875	TTX 1835AP (1835)	1835	
1836	440.900	TTX 1836AP (1836)	1836	
1837	440.925	TTX 1837AP (1837)	1837	
1838	440.950	TTX 1838AP (1838)	1838	
1839	440.975	TTX 1839AP (1839)	1839	
1840	441.000	TTX 1840AP (1840)	1840	
1841	441.025	TTX 1841AP (1841)	1841	
1842	441.050	TTX 1842AP (1842)	1842	
1843	441.075	TTX 1843AP (1843)	1843	
1844	441.100	TTX 1844AP (1844)	1844	
1845	441.125	TTX 1845AP (1845)	1845	
1846	441.150	TTX 1846AP (1846)	1846	
1847	441.175	TTX 1847AP (1847)	1847	
1848	441.200	TTX 1848AP (1848)	1848	
1849	441.225	TTX 1849AP (1849)	1849	
1850	441.250	TTX 1850AP (1850)	1850	
1851	441.275	TTX 1851AP (1851)	1851	
1852	441.300	TTX 1852AP (1852)	1852	
1853	441.325	TTX 1853AP (1853)	1853	
1854	441.350	TTX 1854AP (1854)	1854	
1855	441.375	TTX 1855AP (1855)	1855	
1856	441.400	TTX 1856AP (1856)	1856	
1857	441.425	TTX 1857AP (1857)	1857	
1858	441.450	TTX 1858AP (1858)	1858	
1859	441.475	TTX 1859AP (1859)	1859	
1860	441.500	TTX 1860AP (1860)	1860	
1861	441.525	TTX 1861AP (1861)	1861	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1862	441.550	TTX 1862AP (1862)	1862	
1863	441.575	TTX 1863AP (1863)	1863	
1864	441.600	TTX 1864AP (1864)	1864	
1865	441.625	TTX 1865AP (1865)	1865	
1866	441.650	TTX 1866AP (1866)	1866	
1867	441.675	TTX 1867AP (1867)	1867	
1868	441.700	TTX 1868AP (1868)	1868	
1869	441.725	TTX 1869AP (1869)	1869	
1870	441.750	TTX 1870AP (1870)	1870	
1871	441.775	TTX 1871AP (1871)	1871	
1872	441.800	TTX 1872AP (1872)	1872	
1873	441.825	TTX 1873AP (1873)	1873	
1874	441.850	TTX 1874AP (1874)	1874	
1875	441.875	TTX 1875AP (1875)	1875	
1876	441.900	TTX 1876AP (1876)	1876	
1877	441.925	TTX 1877AP (1877)	1877	
1878	441.950	TTX 1878AP (1878)	1878	
1879	441.975	TTX 1879AP (1879)	1879	
1880	442.000	TTX 1880AP (1880)	1880	
1881	442.025	TTX 1881AP (1881)	1881	
1882	442.050	TTX 1882AP (1882)	1882	
1883	442.075	TTX 1883AP (1883)	1883	
1884	442.100	TTX 1884AP (1884)	1884	
1885	442.125	TTX 1885AP (1885)	1885	
1886	442.150	TTX 1886AP (1886)	1886	
1887	442.175	TTX 1887AP (1887)	1887	
1888	442.200	TTX 1888AP (1888)	1888	
1889	442.225	TTX 1889AP (1889)	1889	
1890	442.250	TTX 1890AP (1890)	1890	
1891	442.275	TTX 1891AP (1891)	1891	
1892	442.300	TTX 1892AP (1892)	1892	
1893	442.325	TTX 1893AP (1893)	1893	
1894	442.350	TTX 1894AP (1894)	1894	
1895	442.375	TTX 1895AP (1895)	1895	
1896	442.400	TTX 1896AP (1896)	1896	
1897	442.425	TTX 1897AP (1897)	1897	
1898	442.450	TTX 1898AP (1898)	1898	
1899	442.475	TTX 1899AP (1899)	1899	
1900	442.500	TTX 1900AP (1900)	1900	
1901	442.525	TTX 1901AP (1901)	1901	
1902	442.550	TTX 1902AP (1902)	1902	
1903	442.575	TTX 1903AP (1903)	1903	
1904	442.600	TTX 1904AP (1904)	1904	
1905	442.625	TTX 1905AP (1905)	1905	
1906	442.650	TTX 1906AP (1906)	1906	
1907	442.675	TTX 1907AP (1907)	1907	
1908	442.700	TTX 1908AP (1908)	1908	
1909	442.725	TTX 1909AP (1909)	1909	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1910	442.750	TTX 1910AP (1910)	1910	
1911	442.775	TTX 1911AP (1911)	1911	
1912	442.800	TTX 1912AP (1912)	1912	
1913	442.825	TTX 1913AP (1913)	1913	
1914	442.850	TTX 1914AP (1914)	1914	
1915	442.875	TTX 1915AP (1915)	1915	
1916	442.900	TTX 1916AP (1916)	1916	
1917	442.925	TTX 1917AP (1917)	1917	
1918	442.950	TTX 1918AP (1918)	1918	
1919	442.975	TTX 1919AP (1919)	1919	
1920	443.000	TTX 1920AP (1920)	1920	
1921	443.025	TTX 1921AP (1921)	1921	
1922	443.050	TTX 1922AP (1922)	1922	
1923	443.075	TTX 1923AP (1923)	1923	
1924	443.100	TTX 1924AP (1924)	1924	
1925	443.125	TTX 1925AP (1925)	1925	
1926	443.150	TTX 1926AP (1926)	1926	
1927	443.175	TTX 1927AP (1927)	1927	
1928	443.200	TTX 1928AP (1928)	1928	
1929	443.225	TTX 1929AP (1929)	1929	
1930	443.250	TTX 1930AP (1930)	1930	
1931	443.275	TTX 1931AP (1931)	1931	
1932	443.300	TTX 1932AP (1932)	1932	
1933	443.325	TTX 1933AP (1933)	1933	
1934	443.350	TTX 1934AP (1934)	1934	
1935	443.375	TTX 1935AP (1935)	1935	
1936	443.400	TTX 1936AP (1936)	1936	
1937	443.425	TTX 1937AP (1937)	1937	
1938	443.450	TTX 1938AP (1938)	1938	
1939	443.475	TTX 1939AP (1939)	1939	
1940	443.500	TTX 1940AP (1940)	1940	
1941	443.525	TTX 1941AP (1941)	1941	
1942	443.550	TTX 1942AP (1942)	1942	
1943	443.575	TTX 1943AP (1943)	1943	
1944	443.600	TTX 1944AP (1944)	1944	
1945	443.625	TTX 1945AP (1945)	1945	
1946	443.650	TTX 1946AP (1946)	1946	
1947	443.675	TTX 1947AP (1947)	1947	
1948	443.700	TTX 1948AP (1948)	1948	
1949	443.725	TTX 1949AP (1949)	1949	
1950	443.750	TTX 1950AP (1950)	1950	
1951	443.775	TTX 1951AP (1951)	1951	
1952	443.800	TTX 1952AP (1952)	1952	
1953	443.825	TTX 1953AP (1953)	1953	
1954	443.850	TTX 1954AP (1954)	1954	
1955	443.875	TTX 1955AP (1955)	1955	
1956	443.900	TTX 1956AP (1956)	1956	
1957	443.925	TTX 1957AP (1957)	1957	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
1958	443.950	TTX 1958AP (1958)	1958	
1959	443.975	TTX 1959AP (1959)	1959	
1960	444.000	TTX 1960AP (1960)	1960	
1961	444.025	TTX 1961AP (1961)	1961	
1962	444.050	TTX 1962AP (1962)	1962	
1963	444.075	TTX 1963AP (1963)	1963	
1964	444.100	TTX 1964AP (1964)	1964	
1965	444.125	TTX 1965AP (1965)	1965	
1966	444.150	TTX 1966AP (1966)	1966	
1967	444.175	TTX 1967AP (1967)	1967	
1968	444.200	TTX 1968AP (1968)	1968	
1969	444.225	TTX 1969AP (1969)	1969	
1970	444.250	TTX 1970AP (1970)	1970	
1971	444.275	TTX 1971AP (1971)	1971	
1972	444.300	TTX 1972AP (1972)	1972	
1973	444.325	TTX 1973AP (1973)	1973	
1974	444.350	TTX 1974AP (1974)	1974	
1975	444.375	TTX 1975AP (1975)	1975	
1976	444.400	TTX 1976AP (1976)	1976	
1977	444.425	TTX 1977AP (1977)	1977	
1978	444.450	TTX 1978AP (1978)	1978	
1979	444.475	TTX 1979AP (1979)	1979	
1980	444.500	TTX 1980AP (1980)	1980	
1981	444.525	TTX 1981AP (1981)	1981	
1982	444.550	TTX 1982AP (1982)	1982	
1983	444.575	TTX 1983AP (1983)	1983	
1984	444.600	TTX 1984AP (1984)	1984	
1985	444.625	TTX 1985AP (1985)	1985	
1986	444.650	TTX 1986AP (1986)	1986	
1987	444.675	TTX 1987AP (1987)	1987	
1988	444.700	TTX 1988AP (1988)	1988	
1989	444.725	TTX 1989AP (1989)	1989	
1990	444.750	TTX 1990AP (1990)	1990	
1991	444.775	TTX 1991AP (1991)	1991	
1992	444.800	TTX 1992AP (1992)	1992	
1993	444.825	TTX 1993AP (1993)	1993	
1994	444.850	TTX 1994AP (1994)	1994	
1995	444.875	TTX 1995AP (1995)	1995	
1996	444.900	TTX 1996AP (1996)	1996	
1997	444.925	TTX 1997AP (1997)	1997	
1998	444.950	TTX 1998AP (1998)	1998	
1999	444.975	TTX 1999AP (1999)	1999	
2000	445.000	TTX 2000AP (2000)	2000	
2001	445.025	TTX 2001AP (2001)	2001	
2002	445.050	TTX 2002AP (2002)	2002	
2003	445.075	TTX 2003AP (2003)	2003	
2004	445.100	TTX 2004AP (2004)	2004	
2005	445.125	TTX 2005AP (2005)	2005	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2006	445.150	TTX 2006AP (2006)	2006	
2007	445.175	TTX 2007AP (2007)	2007	
2008	445.200	TTX 2008AP (2008)	2008	
2009	445.225	TTX 2009AP (2009)	2009	
2010	445.250	TTX 2010AP (2010)	2010	
2011	445.275	TTX 2011AP (2011)	2011	
2012	445.300	TTX 2012AP (2012)	2012	
2013	445.325	TTX 2013AP (2013)	2013	
2014	445.350	TTX 2014AP (2014)	2014	
2015	445.375	TTX 2015AP (2015)	2015	
2016	445.400	TTX 2016AP (2016)	2016	
2017	445.425	TTX 2017AP (2017)	2017	
2018	445.450	TTX 2018AP (2018)	2018	
2019	445.475	TTX 2019AP (2019)	2019	
2020	445.500	TTX 2020AP (2020)	2020	
2021	445.525	TTX 2021AP (2021)	2021	
2022	445.550	TTX 2022AP (2022)	2022	
2023	445.575	TTX 2023AP (2023)	2023	
2024	445.600	TTX 2024AP (2024)	2024	
2025	445.625	TTX 2025AP (2025)	2025	
2026	445.650	TTX 2026AP (2026)	2026	
2027	445.675	TTX 2027AP (2027)	2027	
2028	445.700	TTX 2028AP (2028)	2028	
2029	445.725	TTX 2029AP (2029)	2029	
2030	445.750	TTX 2030AP (2030)	2030	
2031	445.775	TTX 2031AP (2031)	2031	
2032	445.800	TTX 2032AP (2032)	2032	
2033	445.825	TTX 2033AP (2033)	2033	
2034	445.850	TTX 2034AP (2034)	2034	
2035	445.875	TTX 2035AP (2035)	2035	
2036	445.900	TTX 2036AP (2036)	2036	
2037	445.925	TTX 2037AP (2037)	2037	
2038	445.950	TTX 2038AP (2038)	2038	
2039	445.975	TTX 2039AP (2039)	2039	
2040	446.000	TTX 2040AP (2040)	2040	
2041	446.025	TTX 2041AP (2041)	2041	
2042	446.050	TTX 2042AP (2042)	2042	
2043	446.075	TTX 2043AP (2043)	2043	
2044	446.100	TTX 2044AP (2044)	2044	
2045	446.125	TTX 2045AP (2045)	2045	
2046	446.150	TTX 2046AP (2046)	2046	
2047	446.175	TTX 2047AP (2047)	2047	
2048	446.200	TTX 2048AP (2048)	2048	
2049	446.225	TTX 2049AP (2049)	2049	
2050	446.250	TTX 2050AP (2050)	2050	
2051	446.275	TTX 2051AP (2051)	2051	
2052	446.300	TTX 2052AP (2052)	2052	
2053	446.325	TTX 2053AP (2053)	2053	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2054	446.350	TTX 2054AP (2054)	2054	
2055	446.375	TTX 2055AP (2055)	2055	
2056	446.400	TTX 2056AP (2056)	2056	Reserved
2057	446.425	TTX 2057AP (2057)	2057	
2058	446.450	TTX 2058AP (2058)	2058	
2059	446.475	TTX 2059AP (2059)	2059	
2060	446.500	TTX 2060AP (2060)	2060	
2061	446.525	TTX 2061AP (2061)	2061	
2062	446.550	TTX 2062AP (2062)	2062	
2063	446.575	TTX 2063AP (2063)	2063	
2064	446.600	TTX 2064AP (2064)	2064	
2065	446.625	TTX 2065AP (2065)	2065	
2066	446.650	TTX 2066AP (2066)	2066	
2067	446.675	TTX 2067AP (2067)	2067	
2068	446.700	TTX 2068AP (2068)	2068	
2069	446.725	TTX 2069AP (2069)	2069	
2070	446.750	TTX 2070AP (2070)	2070	
2071	446.775	TTX 2071AP (2071)	2071	
2072	446.800	TTX 2072AP (2072)	2072	
2073	446.825	TTX 2073AP (2073)	2073	
2074	446.850	TTX 2074AP (2074)	2074	
2075	446.875	TTX 2075AP (2075)	2075	
2076	446.900	TTX 2076AP (2076)	2076	
2077	446.925	TTX 2077AP (2077)	2077	
2078	446.950	TTX 2078AP (2078)	2078	
2079	446.975	TTX 2079AP (2079)	2079	
2080	447.000	TTX 2080AP (2080)	2080	
2081	447.025	TTX 2081AP (2081)	2081	
2082	447.050	TTX 2082AP (2082)	2082	
2083	447.075	TTX 2083AP (2083)	2083	
2084	447.100	TTX 2084AP (2084)	2084	
2085	447.125	TTX 2085AP (2085)	2085	
2086	447.150	TTX 2086AP (2086)	2086	
2087	447.175	TTX 2087AP (2087)	2087	
2088	447.200	TTX 2088AP (2088)	2088	
2089	447.225	TTX 2089AP (2089)	2089	
2090	447.250	TTX 2090AP (2090)	2090	
2091	447.275	TTX 2091AP (2091)	2091	
2092	447.300	TTX 2092AP (2092)	2092	
2093	447.325	TTX 2093AP (2093)	2093	
2094	447.350	TTX 2094AP (2094)	2094	
2095	447.375	TTX 2095AP (2095)	2095	
2096	447.400	TTX 2096AP (2096)	2096	
2097	447.425	TTX 2097AP (2097)	2097	
2098	447.450	TTX 2098AP (2098)	2098	
2099	447.475	TTX 2099AP (2099)	2099	
2100	447.500	TTX 2100AP (2100)	2100	
2101	447.525	TTX 2101AP (2101)	2101	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2102	447.550	TTX 2102AP (2102)	2102	
2103	447.575	TTX 2103AP (2103)	2103	
2104	447.600	TTX 2104AP (2104)	2104	
2105	447.625	TTX 2105AP (2105)	2105	
2106	447.650	TTX 2106AP (2106)	2106	
2107	447.675	TTX 2107AP (2107)	2107	
2108	447.700	TTX 2108AP (2108)	2108	
2109	447.725	TTX 2109AP (2109)	2109	
2110	447.750	TTX 2110AP (2110)	2110	
2111	447.775	TTX 2111AP (2111)	2111	
2112	447.800	TTX 2112AP (2112)	2112	
2113	447.825	TTX 2113AP (2113)	2113	
2114	447.850	TTX 2114AP (2114)	2114	
2115	447.875	TTX 2115AP (2115)	2115	
2116	447.900	TTX 2116AP (2116)	2116	
2117	447.925	TTX 2117AP (2117)	2117	
2118	447.950	TTX 2118AP (2118)	2118	
2119	447.975	TTX 2119AP (2119)	2119	
2120	448.000	TTX 2120AP (2120)	2120	
2121	448.025	TTX 2121AP (2121)	2121	
2122	448.050	TTX 2122AP (2122)	2122	
2123	448.075	TTX 2123AP (2123)	2123	
2124	448.100	TTX 2124AP (2124)	2124	
2125	448.125	TTX 2125AP (2125)	2125	
2126	448.150	TTX 2126AP (2126)	2126	
2127	448.175	TTX 2127AP (2127)	2127	
2128	448.200	TTX 2128AP (2128)	2128	
2129	448.225	TTX 2129AP (2129)	2129	
2130	448.250	TTX 2130AP (2130)	2130	
2131	448.275	TTX 2131AP (2131)	2131	
2132	448.300	TTX 2132AP (2132)	2132	
2133	448.325	TTX 2133AP (2133)	2133	
2134	448.350	TTX 2134AP (2134)	2134	
2135	448.375	TTX 2135AP (2135)	2135	
2136	448.400	TTX 2136AP (2136)	2136	
2137	448.425	TTX 2137AP (2137)	2137	
2138	448.450	TTX 2138AP (2138)	2138	
2139	448.475	TTX 2139AP (2139)	2139	
2140	448.500	TTX 2140AP (2140)	2140	
2141	448.525	TTX 2141AP (2141)	2141	
2142	448.550	TTX 2142AP (2142)	2142	
2143	448.575	TTX 2143AP (2143)	2143	
2144	448.600	TTX 2144AP (2144)	2144	
2145	448.625	TTX 2145AP (2145)	2145	
2146	448.650	TTX 2146AP (2146)	2146	
2147	448.675	TTX 2147AP (2147)	2147	
2148	448.700	TTX 2148AP (2148)	2148	
2149	448.725	TTX 2149AP (2149)	2149	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2150	448.750	TTX 2150AP (2150)	2150	
2151	448.775	TTX 2151AP (2151)	2151	
2152	448.800	TTX 2152AP (2152)	2152	
2153	448.825	TTX 2153AP (2153)	2153	
2154	448.850	TTX 2154AP (2154)	2154	
2155	448.875	TTX 2155AP (2155)	2155	
2156	448.900	TTX 2156AP (2156)	2156	
2157	448.925	TTX 2157AP (2157)	2157	
2158	448.950	TTX 2158AP (2158)	2158	
2159	448.975	TTX 2159AP (2159)	2159	
2160	449.000	TTX 2160AP (2160)	2160	
2161	449.025	TTX 2161AP (2161)	2161	
2162	449.050	TTX 2162AP (2162)	2162	
2163	449.075	TTX 2163AP (2163)	2163	
2164	449.100	TTX 2164AP (2164)	2164	
2165	449.125	TTX 2165AP (2165)	2165	
2166	449.150	TTX 2166AP (2166)	2166	
2167	449.175	TTX 2167AP (2167)	2167	
2168	449.200	TTX 2168AP (2168)	2168	
2169	449.225	TTX 2169AP (2169)	2169	
2170	449.250	TTX 2170AP (2170)	2170	
2171	449.275	TTX 2171AP (2171)	2171	
2172	449.300	TTX 2172AP (2172)	2172	
2173	449.325	TTX 2173AP (2173)	2173	
2174	449.350	TTX 2174AP (2174)	2174	
2175	449.375	TTX 2175AP (2175)	2175	
2176	449.400	TTX 2176AP (2176)	2176	
2177	449.425	TTX 2177AP (2177)	2177	
2178	449.450	TTX 2178AP (2178)	2178	
2179	449.475	TTX 2179AP (2179)	2179	
2180	449.500	TTX 2180AP (2180)	2180	
2181	449.525	TTX 2181AP (2181)	2181	
2182	449.550	TTX 2182AP (2182)	2182	
2183	449.575	TTX 2183AP (2183)	2183	
2184	449.600	TTX 2184AP (2184)	2184	
2185	449.625	TTX 2185AP (2185)	2185	
2186	449.650	TTX 2186AP (2186)	2186	
2187	449.675	TTX 2187AP (2187)	2187	
2188	449.700	TTX 2188AP (2188)	2188	
2189	449.725	TTX 2189AP (2189)	2189	
2190	449.750	TTX 2190AP (2190)	2190	
2191	449.775	TTX 2191AP (2191)	2191	
2192	449.800	TTX 2192AP (2192)	2192	
2193	449.825	TTX 2193AP (2193)	2193	
2194	449.850	TTX 2194AP (2194)	2194	
2195	449.875	TTX 2195AP (2195)	2195	
2196	449.900	TTX 2196AP (2196)	2196	
2197	449.925	TTX 2197AP (2197)	2197	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2198	449.950	TTX 2198AP (2198)	2198	
2199	449.975	TTX 2199AP (2199)	2199	
2200	450.000	TTX 2200AP (2200)	2200	Reserved
2201	450.025	TTX 2201AP (2201)	2201	
2202	450.050	TTX 2202AP (2202)	2202	
2203	450.075	TTX 2203AP (2203)	2203	
2204	450.100	TTX 2204AP (2204)	2204	
2205	450.125	TTX 2205AP (2205)	2205	
2206	450.150	TTX 2206AP (2206)	2206	
2207	450.175	TTX 2207AP (2207)	2207	
2208	450.200	TTX 2208AP (2208)	2208	
2209	450.225	TTX 2209AP (2209)	2209	
2210	450.250	TTX 2210AP (2210)	2210	
2211	450.275	TTX 2211AP (2211)	2211	
2212	450.300	TTX 2212AP (2212)	2212	
2213	450.325	TTX 2213AP (2213)	2213	
2214	450.350	TTX 2214AP (2214)	2214	
2215	450.375	TTX 2215AP (2215)	2215	
2216	450.400	TTX 2216AP (2216)	2216	
2217	450.425	TTX 2217AP (2217)	2217	
2218	450.450	TTX 2218AP (2218)	2218	
2219	450.475	TTX 2219AP (2219)	2219	
2220	450.500	TTX 2220AP (2220)	2220	
2221	450.525	TTX 2221AP (2221)	2221	
2222	450.550	TTX 2222AP (2222)	2222	
2223	450.575	TTX 2223AP (2223)	2223	
2224	450.600	TTX 2224AP (2224)	2224	
2225	450.625	TTX 2225AP (2225)	2225	
2226	450.650	TTX 2226AP (2226)	2226	
2227	450.675	TTX 2227AP (2227)	2227	
2228	450.700	TTX 2228AP (2228)	2228	
2229	450.725	TTX 2229AP (2229)	2229	
2230	450.750	TTX 2230AP (2230)	2230	
2231	450.775	TTX 2231AP (2231)	2231	
2232	450.800	TTX 2232AP (2232)	2232	
2233	450.825	TTX 2233AP (2233)	2233	
2234	450.850	TTX 2234AP (2234)	2234	
2235	450.875	TTX 2235AP (2235)	2235	
2236	450.900	TTX 2236AP (2236)	2236	
2237	450.925	TTX 2237AP (2237)	2237	
2238	450.950	TTX 2238AP (2238)	2238	
2239	450.975	TTX 2239AP (2239)	2239	
2240	451.000	TTX 2240AP (2240)	2240	
2241	451.025	TTX 2241AP (2241)	2241	
2242	451.050	TTX 2242AP (2242)	2242	
2243	451.075	TTX 2243AP (2243)	2243	
2244	451.100	TTX 2244AP (2244)	2244	
2245	451.125	TTX 2245AP (2245)	2245	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2246	451.150	TTX 2246AP (2246)	2246	
2247	451.175	TTX 2247AP (2247)	2247	
2248	451.200	TTX 2248AP (2248)	2248	
2249	451.225	TTX 2249AP (2249)	2249	
2250	451.250	TTX 2250AP (2250)	2250	
2251	451.275	TTX 2251AP (2251)	2251	
2252	451.300	TTX 2252AP (2252)	2252	
2253	451.325	TTX 2253AP (2253)	2253	
2254	451.350	TTX 2254AP (2254)	2254	
2255	451.375	TTX 2255AP (2255)	2255	
2256	451.400	TTX 2256AP (2256)	2256	
2257	451.425	TTX 2257AP (2257)	2257	
2258	451.450	TTX 2258AP (2258)	2258	
2259	451.475	TTX 2259AP (2259)	2259	
2260	451.500	TTX 2260AP (2260)	2260	
2261	451.525	TTX 2261AP (2261)	2261	
2262	451.550	TTX 2262AP (2262)	2262	
2263	451.575	TTX 2263AP (2263)	2263	
2264	451.600	TTX 2264AP (2264)	2264	
2265	451.625	TTX 2265AP (2265)	2265	
2266	451.650	TTX 2266AP (2266)	2266	
2267	451.675	TTX 2267AP (2267)	2267	
2268	451.700	TTX 2268AP (2268)	2268	
2269	451.725	TTX 2269AP (2269)	2269	
2270	451.750	TTX 2270AP (2270)	2270	
2271	451.775	TTX 2271AP (2271)	2271	
2272	451.800	TTX 2272AP (2272)	2272	
2273	451.825	TTX 2273AP (2273)	2273	
2274	451.850	TTX 2274AP (2274)	2274	
2275	451.875	TTX 2275AP (2275)	2275	
2276	451.900	TTX 2276AP (2276)	2276	
2277	451.925	TTX 2277AP (2277)	2277	
2278	451.950	TTX 2278AP (2278)	2278	
2279	451.975	TTX 2279AP (2279)	2279	
2280	452.000	TTX 2280AP (2280)	2280	
2281	452.025	TTX 2281AP (2281)	2281	
2282	452.050	TTX 2282AP (2282)	2282	
2283	452.075	TTX 2283AP (2283)	2283	
2284	452.100	TTX 2284AP (2284)	2284	
2285	452.125	TTX 2285AP (2285)	2285	
2286	452.150	TTX 2286AP (2286)	2286	
2287	452.175	TTX 2287AP (2287)	2287	
2288	452.200	TTX 2288AP (2288)	2288	
2289	452.225	TTX 2289AP (2289)	2289	
2290	452.250	TTX 2290AP (2290)	2290	
2291	452.275	TTX 2291AP (2291)	2291	
2292	452.300	TTX 2292AP (2292)	2292	
2293	452.325	TTX 2293AP (2293)	2293	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2294	452.350	TTX 2294AP (2294)	2294	
2295	452.375	TTX 2295AP (2295)	2295	
2296	452.400	TTX 2296AP (2296)	2296	
2297	452.425	TTX 2297AP (2297)	2297	
2298	452.450	TTX 2298AP (2298)	2298	
2299	452.475	TTX 2299AP (2299)	2299	
2300	452.500	TTX 2300AP (2300)	2300	
2301	452.525	TTX 2301AP (2301)	2301	
2302	452.550	TTX 2302AP (2302)	2302	
2303	452.575	TTX 2303AP (2303)	2303	
2304	452.600	TTX 2304AP (2304)	2304	
2305	452.625	TTX 2305AP (2305)	2305	
2306	452.650	TTX 2306AP (2306)	2306	
2307	452.675	TTX 2307AP (2307)	2307	
2308	452.700	TTX 2308AP (2308)	2308	
2309	452.725	TTX 2309AP (2309)	2309	
2310	452.750	TTX 2310AP (2310)	2310	
2311	452.775	TTX 2311AP (2311)	2311	
2312	452.800	TTX 2312AP (2312)	2312	
2313	452.825	TTX 2313AP (2313)	2313	
2314	452.850	TTX 2314AP (2314)	2314	
2315	452.875	TTX 2315AP (2315)	2315	
2316	452.900	TTX 2316AP (2316)	2316	
2317	452.925	TTX 2317AP (2317)	2317	
2318	452.950	TTX 2318AP (2318)	2318	
2319	452.975	TTX 2319AP (2319)	2319	
2320	453.000	TTX 2320AP (2320)	2320	
2321	453.025	TTX 2321AP (2321)	2321	
2322	453.050	TTX 2322AP (2322)	2322	
2323	453.075	TTX 2323AP (2323)	2323	
2324	453.100	TTX 2324AP (2324)	2324	
2325	453.125	TTX 2325AP (2325)	2325	
2326	453.150	TTX 2326AP (2326)	2326	
2327	453.175	TTX 2327AP (2327)	2327	
2328	453.200	TTX 2328AP (2328)	2328	
2329	453.225	TTX 2329AP (2329)	2329	
2330	453.250	TTX 2330AP (2330)	2330	
2331	453.275	TTX 2331AP (2331)	2331	
2332	453.300	TTX 2332AP (2332)	2332	
2333	453.325	TTX 2333AP (2333)	2333	
2334	453.350	TTX 2334AP (2334)	2334	
2335	453.375	TTX 2335AP (2335)	2335	
2336	453.400	TTX 2336AP (2336)	2336	
2337	453.425	TTX 2337AP (2337)	2337	
2338	453.450	TTX 2338AP (2338)	2338	
2339	453.475	TTX 2339AP (2339)	2339	
2340	453.500	TTX 2340AP (2340)	2340	
2341	453.525	TTX 2341AP (2341)	2341	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2342	453.550	TTX 2342AP (2342)	2342	
2343	453.575	TTX 2343AP (2343)	2343	
2344	453.600	TTX 2344AP (2344)	2344	
2345	453.625	TTX 2345AP (2345)	2345	
2346	453.650	TTX 2346AP (2346)	2346	
2347	453.675	TTX 2347AP (2347)	2347	
2348	453.700	TTX 2348AP (2348)	2348	
2349	453.725	TTX 2349AP (2349)	2349	
2350	453.750	TTX 2350AP (2350)	2350	
2351	453.775	TTX 2351AP (2351)	2351	
2352	453.800	TTX 2352AP (2352)	2352	
2353	453.825	TTX 2353AP (2353)	2353	
2354	453.850	TTX 2354AP (2354)	2354	
2355	453.875	TTX 2355AP (2355)	2355	
2356	453.900	TTX 2356AP (2356)	2356	
2357	453.925	TTX 2357AP (2357)	2357	
2358	453.950	TTX 2358AP (2358)	2358	
2359	453.975	TTX 2359AP (2359)	2359	
2360	454.000	TTX 2360AP (2360)	2360	
2361	454.025	TTX 2361AP (2361)	2361	
2362	454.050	TTX 2362AP (2362)	2362	
2363	454.075	TTX 2363AP (2363)	2363	
2364	454.100	TTX 2364AP (2364)	2364	
2365	454.125	TTX 2365AP (2365)	2365	
2366	454.150	TTX 2366AP (2366)	2366	
2367	454.175	TTX 2367AP (2367)	2367	
2368	454.200	TTX 2368AP (2368)	2368	
2369	454.225	TTX 2369AP (2369)	2369	
2370	454.250	TTX 2370AP (2370)	2370	
2371	454.275	TTX 2371AP (2371)	2371	
2372	454.300	TTX 2372AP (2372)	2372	
2373	454.325	TTX 2373AP (2373)	2373	
2374	454.350	TTX 2374AP (2374)	2374	
2375	454.375	TTX 2375AP (2375)	2375	
2376	454.400	TTX 2376AP (2376)	2376	
2377	454.425	TTX 2377AP (2377)	2377	
2378	454.450	TTX 2378AP (2378)	2378	
2379	454.475	TTX 2379AP (2379)	2379	
2380	454.500	TTX 2380AP (2380)	2380	
2381	454.525	TTX 2381AP (2381)	2381	
2382	454.550	TTX 2382AP (2382)	2382	
2383	454.575	TTX 2383AP (2383)	2383	
2384	454.600	TTX 2384AP (2384)	2384	
2385	454.625	TTX 2385AP (2385)	2385	
2386	454.650	TTX 2386AP (2386)	2386	
2387	454.675	TTX 2387AP (2387)	2387	
2388	454.700	TTX 2388AP (2388)	2388	
2389	454.725	TTX 2389AP (2389)	2389	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2390	454.750	TTX 2390AP (2390)	2390	
2391	454.775	TTX 2391AP (2391)	2391	
2392	454.800	TTX 2392AP (2392)	2392	
2393	454.825	TTX 2393AP (2393)	2393	
2394	454.850	TTX 2394AP (2394)	2394	
2395	454.875	TTX 2395AP (2395)	2395	
2396	454.900	TTX 2396AP (2396)	2396	
2397	454.925	TTX 2397AP (2397)	2397	
2398	454.950	TTX 2398AP (2398)	2398	
2399	454.975	TTX 2399AP (2399)	2399	
2400	455.000	TTX 2400AP (2400)	2400	
2401	455.025	TTX 2401AP (2401)	2401	
2402	455.050	TTX 2402AP (2402)	2402	
2403	455.075	TTX 2403AP (2403)	2403	
2404	455.100	TTX 2404AP (2404)	2404	
2405	455.125	TTX 2405AP (2405)	2405	
2406	455.150	TTX 2406AP (2406)	2406	
2407	455.175	TTX 2407AP (2407)	2407	
2408	455.200	TTX 2408AP (2408)	2408	
2409	455.225	TTX 2409AP (2409)	2409	
2410	455.250	TTX 2410AP (2410)	2410	
2411	455.275	TTX 2411AP (2411)	2411	
2412	455.300	TTX 2412AP (2412)	2412	
2413	455.325	TTX 2413AP (2413)	2413	
2414	455.350	TTX 2414AP (2414)	2414	
2415	455.375	TTX 2415AP (2415)	2415	
2416	455.400	TTX 2416AP (2416)	2416	
2417	455.425	TTX 2417AP (2417)	2417	
2418	455.450	TTX 2418AP (2418)	2418	
2419	455.475	TTX 2419AP (2419)	2419	
2420	455.500	TTX 2420AP (2420)	2420	
2421	455.525	TTX 2421AP (2421)	2421	
2422	455.550	TTX 2422AP (2422)	2422	
2423	455.575	TTX 2423AP (2423)	2423	
2424	455.600	TTX 2424AP (2424)	2424	
2425	455.625	TTX 2425AP (2425)	2425	
2426	455.650	TTX 2426AP (2426)	2426	
2427	455.675	TTX 2427AP (2427)	2427	
2428	455.700	TTX 2428AP (2428)	2428	
2429	455.725	TTX 2429AP (2429)	2429	
2430	455.750	TTX 2430AP (2430)	2430	
2431	455.775	TTX 2431AP (2431)	2431	
2432	455.800	TTX 2432AP (2432)	2432	
2433	455.825	TTX 2433AP (2433)	2433	
2434	455.850	TTX 2434AP (2434)	2434	
2435	455.875	TTX 2435AP (2435)	2435	
2436	455.900	TTX 2436AP (2436)	2436	
2437	455.925	TTX 2437AP (2437)	2437	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2438	455.950	TTX 2438AP (2438)	2438	
2439	455.975	TTX 2439AP (2439)	2439	
2440	456.000	TTX 2440AP (2440)	2440	
2441	456.025	TTX 2441AP (2441)	2441	
2442	456.050	TTX 2442AP (2442)	2442	
2443	456.075	TTX 2443AP (2443)	2443	
2444	456.100	TTX 2444AP (2444)	2444	
2445	456.125	TTX 2445AP (2445)	2445	
2446	456.150	TTX 2446AP (2446)	2446	
2447	456.175	TTX 2447AP (2447)	2447	
2448	456.200	TTX 2448AP (2448)	2448	
2449	456.225	TTX 2449AP (2449)	2449	
2450	456.250	TTX 2450AP (2450)	2450	
2451	456.275	TTX 2451AP (2451)	2451	
2452	456.300	TTX 2452AP (2452)	2452	
2453	456.325	TTX 2453AP (2453)	2453	
2454	456.350	TTX 2454AP (2454)	2454	
2455	456.375	TTX 2455AP (2455)	2455	
2456	456.400	TTX 2456AP (2456)	2456	
2457	456.425	TTX 2457AP (2457)	2457	
2458	456.450	TTX 2458AP (2458)	2458	
2459	456.475	TTX 2459AP (2459)	2459	
2460	456.500	TTX 2460AP (2460)	2460	
2461	456.525	TTX 2461AP (2461)	2461	
2462	456.550	TTX 2462AP (2462)	2462	
2463	456.575	TTX 2463AP (2463)	2463	
2464	456.600	TTX 2464AP (2464)	2464	
2465	456.625	TTX 2465AP (2465)	2465	
2466	456.650	TTX 2466AP (2466)	2466	
2467	456.675	TTX 2467AP (2467)	2467	
2468	456.700	TTX 2468AP (2468)	2468	
2469	456.725	TTX 2469AP (2469)	2469	
2470	456.750	TTX 2470AP (2470)	2470	
2471	456.775	TTX 2471AP (2471)	2471	
2472	456.800	TTX 2472AP (2472)	2472	
2473	456.825	TTX 2473AP (2473)	2473	
2474	456.850	TTX 2474AP (2474)	2474	
2475	456.875	TTX 2475AP (2475)	2475	
2476	456.900	TTX 2476AP (2476)	2476	
2477	456.925	TTX 2477AP (2477)	2477	
2478	456.950	TTX 2478AP (2478)	2478	
2479	456.975	TTX 2479AP (2479)	2479	
2480	457.000	TTX 2480AP (2480)	2480	
2481	457.025	TTX 2481AP (2481)	2481	
2482	457.050	TTX 2482AP (2482)	2482	
2483	457.075	TTX 2483AP (2483)	2483	
2484	457.100	TTX 2484AP (2484)	2484	
2485	457.125	TTX 2485AP (2485)	2485	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2486	457.150	TTX 2486AP (2486)	2486	
2487	457.175	TTX 2487AP (2487)	2487	
2488	457.200	TTX 2488AP (2488)	2488	
2489	457.225	TTX 2489AP (2489)	2489	
2490	457.250	TTX 2490AP (2490)	2490	
2491	457.275	TTX 2491AP (2491)	2491	
2492	457.300	TTX 2492AP (2492)	2492	
2493	457.325	TTX 2493AP (2493)	2493	
2494	457.350	TTX 2494AP (2494)	2494	
2495	457.375	TTX 2495AP (2495)	2495	
2496	457.400	TTX 2496AP (2496)	2496	
2497	457.425	TTX 2497AP (2497)	2497	
2498	457.450	TTX 2498AP (2498)	2498	
2499	457.475	TTX 2499AP (2499)	2499	
2500	457.500	TTX 2500AP (2500)	2500	
2501	457.525	TTX 2501AP (2501)	2501	
2502	457.550	TTX 2502AP (2502)	2502	
2503	457.575	TTX 2503AP (2503)	2503	
2504	457.600	TTX 2504AP (2504)	2504	
2505	457.625	TTX 2505AP (2505)	2505	
2506	457.650	TTX 2506AP (2506)	2506	
2507	457.675	TTX 2507AP (2507)	2507	
2508	457.700	TTX 2508AP (2508)	2508	
2509	457.725	TTX 2509AP (2509)	2509	
2510	457.750	TTX 2510AP (2510)	2510	
2511	457.775	TTX 2511AP (2511)	2511	
2512	457.800	TTX 2512AP (2512)	2512	
2513	457.825	TTX 2513AP (2513)	2513	
2514	457.850	TTX 2514AP (2514)	2514	
2515	457.875	TTX 2515AP (2515)	2515	
2516	457.900	TTX 2516AP (2516)	2516	
2517	457.925	TTX 2517AP (2517)	2517	
2518	457.950	TTX 2518AP (2518)	2518	
2519	457.975	TTX 2519AP (2519)	2519	
2520	458.000	TTX 2520AP (2520)	2520	
2521	458.025	TTX 2521AP (2521)	2521	
2522	458.050	TTX 2522AP (2522)	2522	
2523	458.075	TTX 2523AP (2523)	2523	
2524	458.100	TTX 2524AP (2524)	2524	
2525	458.125	TTX 2525AP (2525)	2525	
2526	458.150	TTX 2526AP (2526)	2526	
2527	458.175	TTX 2527AP (2527)	2527	
2528	458.200	TTX 2528AP (2528)	2528	
2529	458.225	TTX 2529AP (2529)	2529	
2530	458.250	TTX 2530AP (2530)	2530	
2531	458.275	TTX 2531AP (2531)	2531	
2532	458.300	TTX 2532AP (2532)	2532	
2533	458.325	TTX 2533AP (2533)	2533	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2534	458.350	TTX 2534AP (2534)	2534	
2535	458.375	TTX 2535AP (2535)	2535	
2536	458.400	TTX 2536AP (2536)	2536	
2537	458.425	TTX 2537AP (2537)	2537	
2538	458.450	TTX 2538AP (2538)	2538	
2539	458.475	TTX 2539AP (2539)	2539	
2540	458.500	TTX 2540AP (2540)	2540	
2541	458.525	TTX 2541AP (2541)	2541	
2542	458.550	TTX 2542AP (2542)	2542	
2543	458.575	TTX 2543AP (2543)	2543	
2544	458.600	TTX 2544AP (2544)	2544	
2545	458.625	TTX 2545AP (2545)	2545	
2546	458.650	TTX 2546AP (2546)	2546	
2547	458.675	TTX 2547AP (2547)	2547	
2548	458.700	TTX 2548AP (2548)	2548	
2549	458.725	TTX 2549AP (2549)	2549	
2550	458.750	TTX 2550AP (2550)	2550	
2551	458.775	TTX 2551AP (2551)	2551	
2552	458.800	TTX 2552AP (2552)	2552	
2553	458.825	TTX 2553AP (2553)	2553	
2554	458.850	TTX 2554AP (2554)	2554	
2555	458.875	TTX 2555AP (2555)	2555	
2556	458.900	TTX 2556AP (2556)	2556	
2557	458.925	TTX 2557AP (2557)	2557	
2558	458.950	TTX 2558AP (2558)	2558	
2559	458.975	TTX 2559AP (2559)	2559	
2560	459.000	TTX 2560AP (2560)	2560	
2561	459.025	TTX 2561AP (2561)	2561	
2562	459.050	TTX 2562AP (2562)	2562	
2563	459.075	TTX 2563AP (2563)	2563	
2564	459.100	TTX 2564AP (2564)	2564	
2565	459.125	TTX 2565AP (2565)	2565	
2566	459.150	TTX 2566AP (2566)	2566	
2567	459.175	TTX 2567AP (2567)	2567	
2568	459.200	TTX 2568AP (2568)	2568	
2569	459.225	TTX 2569AP (2569)	2569	
2570	459.250	TTX 2570AP (2570)	2570	
2571	459.275	TTX 2571AP (2571)	2571	
2572	459.300	TTX 2572AP (2572)	2572	
2573	459.325	TTX 2573AP (2573)	2573	
2574	459.350	TTX 2574AP (2574)	2574	
2575	459.375	TTX 2575AP (2575)	2575	
2576	459.400	TTX 2576AP (2576)	2576	
2577	459.425	TTX 2577AP (2577)	2577	
2578	459.450	TTX 2578AP (2578)	2578	
2579	459.475	TTX 2579AP (2579)	2579	
2580	459.500	TTX 2580AP (2580)	2580	
2581	459.525	TTX 2581AP (2581)	2581	

TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
2582	459.550	TTX 2582AP (2582)	2582	
2583	459.575	TTX 2583AP (2583)	2583	
2584	459.600	TTX 2584AP (2584)	2584	
2585	459.625	TTX 2585AP (2585)	2585	
2586	459.650	TTX 2586AP (2586)	2586	
2587	459.675	TTX 2587AP (2587)	2587	
2588	459.700	TTX 2588AP (2588)	2588	
2589	459.725	TTX 2589AP (2589)	2589	
2590	459.750	TTX 2590AP (2590)	2590	
2591	459.775	TTX 2591AP (2591)	2591	
2592	459.800	TTX 2592AP (2592)	2592	
2593	459.825	TTX 2593AP (2593)	2593	
2594	459.850	TTX 2594AP (2594)	2594	
2595	459.875	TTX 2595AP (2595)	2595	
2596	459.900	TTX 2596AP (2596)	2596	
2597	459.925	TTX 2597AP (2597)	2597	
2598	459.950	TTX 2598AP (2598)	2598	
2599	459.975	TTX 2599AP (2599)	2599	
2600	460.000	TTX 2600AP (2600)	2600	

For your notes

600MHz TTX Frequency Chart

Frequency (MHz) = ((TTX – 1000)* 0.025) + 420

U.S. TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	TTX # (prog. box)	Note
…					
33	7561	584.025	TTX 7561AP (7561)	7561	
33	7562	584.050	TTX 7562AP (7562)	7562	
33	7563	584.075	TTX 7563AP (7563)	7563	
33	7564	584.100	TTX 7564AP (7564)	7564	
33	7565	584.125	TTX 7565AP (7565)	7565	
33	7566	584.150	TTX 7566AP (7566)	7566	
33	7567	584.175	TTX 7567AP (7567)	7567	
33	7568	584.200	TTX 7568AP (7568)	7568	
33	7569	584.225	TTX 7569AP (7569)	7569	
33	7570	584.250	TTX 7570AP (7570)	7570	
33	7571	584.275	TTX 7571AP (7571)	7571	
33	7572	584.300	TTX 7572AP (7572)	7572	
33	7573	584.325	TTX 7573AP (7573)	7573	
33	7574	584.350	TTX 7574AP (7574)	7574	
33	7575	584.375	TTX 7575AP (7575)	7575	
33	7576	584.400	TTX 7576AP (7576)	7576	
33	7577	584.425	TTX 7577AP (7577)	7577	
33	7578	584.450	TTX 7578AP (7578)	7578	
33	7579	584.475	TTX 7579AP (7579)	7579	
33	7580	584.500	TTX 7580AP (7580)	7580	
33	7581	584.525	TTX 7581AP (7581)	7581	
33	7582	584.550	TTX 7582AP (7582)	7582	
33	7583	584.575	TTX 7583AP (7583)	7583	
33	7584	584.600	TTX 7584AP (7584)	7584	
33	7585	584.625	TTX 7585AP (7585)	7585	
33	7586	584.650	TTX 7586AP (7586)	7586	
33	7587	584.675	TTX 7587AP (7587)	7587	
33	7588	584.700	TTX 7588AP (7588)	7588	
33	7589	584.725	TTX 7589AP (7589)	7589	
33	7590	584.750	TTX 7590AP (7590)	7590	
33	7591	584.775	TTX 7591AP (7591)	7591	
33	7592	584.800	TTX 7592AP (7592)	7592	
33	7593	584.825	TTX 7593AP (7593)	7593	
33	7594	584.850	TTX 7594AP (7594)	7594	
33	7595	584.875	TTX 7595AP (7595)	7595	
33	7596	584.900	TTX 7596AP (7596)	7596	
33	7597	584.925	TTX 7597AP (7597)	7597	
33	7598	584.950	TTX 7598AP (7598)	7598	
33	7599	584.975	TTX 7599AP (7599)	7599	
33	7600	585.000	TTX 7600AP (7600)	7600	
33	7601	585.025	TTX 7601AP (7601)	7601	
33	7602	585.050	TTX 7602AP (7602)	7602	
33	7603	585.075	TTX 7603AP (7603)	7603	
33	7604	585.100	TTX 7604AP (7604)	7604	
33	7605	585.125	TTX 7605AP (7605)	7605	
33	7606	585.150	TTX 7606AP (7606)	7606	
33	7607	585.175	TTX 7607AP (7607)	7607	
33	7608	585.200	TTX 7608AP (7608)	7608	
33	7609	585.225	TTX 7609AP (7609)	7609	
33	7610	585.250	TTX 7610AP (7610)	7610	
33	7611	585.275	TTX 7611AP (7611)	7611	
33	7612	585.300	TTX 7612AP (7612)	7612	
33	7613	585.325	TTX 7613AP (7613)	7613	
33	7614	585.350	TTX 7614AP (7614)	7614	
33	7615	585.375	TTX 7615AP (7615)	7615	
33	7616	585.400	TTX 7616AP (7616)	7616	
33	7617	585.425	TTX 7617AP (7617)	7617	
33	7618	585.450	TTX 7618AP (7618)	7618	
33	7619	585.475	TTX 7619AP (7619)	7619	
33	7620	585.500	TTX 7620AP (7620)	7620	
33	7621	585.525	TTX 7621AP (7621)	7621	
33	7622	585.550	TTX 7622AP (7622)	7622	
33	7623	585.575	TTX 7623AP (7623)	7623	
33	7624	585.600	TTX 7624AP (7624)	7624	
33	7625	585.625	TTX 7625AP (7625)	7625	
33	7626	585.650	TTX 7626AP (7626)	7626	
33	7627	585.675	TTX 7627AP (7627)	7627	
33	7628	585.700	TTX 7628AP (7628)	7628	
33	7629	585.725	TTX 7629AP (7629)	7629	
33	7630	585.750	TTX 7630AP (7630)	7630	
33	7631	585.775	TTX 7631AP (7631)	7631	
33	7632	585.800	TTX 7632AP (7632)	7632	
33	7633	585.825	TTX 7633AP (7633)	7633	
33	7634	585.850	TTX 7634AP (7634)	7634	
33	7635	585.875	TTX 7635AP (7635)	7635	
33	7636	585.900	TTX 7636AP (7636)	7636	
33	7637	585.925	TTX 7637AP (7637)	7637	
33	7638	585.950	TTX 7638AP (7638)	7638	
33	7639	585.975	TTX 7639AP (7639)	7639	
33	7640	586.000	TTX 7640AP (7640)	7640	
33	7641	586.025	TTX 7641AP (7641)	7641	
33	7642	586.050	TTX 7642AP (7642)	7642	
33	7643	586.075	TTX 7643AP (7643)	7643	
33	7644	586.100	TTX 7644AP (7644)	7644	
33	7645	586.125	TTX 7645AP (7645)	7645	
33	7646	586.150	TTX 7646AP (7646)	7646	
33	7647	586.175	TTX 7647AP (7647)	7647	
33	7648	586.200	TTX 7648AP (7648)	7648	
33	7649	586.225	TTX 7649AP (7649)	7649	
33	7650	586.250	TTX 7650AP (7650)	7650	
33	7651	586.275	TTX 7651AP (7651)	7651	
33	7652	586.300	TTX 7652AP (7652)	7652	
33	7653	586.325	TTX 7653AP (7653)	7653	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
33	7654	586.350	TTX 7654AP (7654)	7654	
33	7655	586.375	TTX 7655AP (7655)	7655	
33	7656	586.400	TTX 7656AP (7656)	7656	
33	7657	586.425	TTX 7657AP (7657)	7657	
33	7658	586.450	TTX 7658AP (7658)	7658	
33	7659	586.475	TTX 7659AP (7659)	7659	
33	7660	586.500	TTX 7660AP (7660)	7660	
33	7661	586.525	TTX 7661AP (7661)	7661	
33	7662	586.550	TTX 7662AP (7662)	7662	
33	7663	586.575	TTX 7663AP (7663)	7663	
33	7664	586.600	TTX 7664AP (7664)	7664	
33	7665	586.625	TTX 7665AP (7665)	7665	
33	7666	586.650	TTX 7666AP (7666)	7666	
33	7667	586.675	TTX 7667AP (7667)	7667	
33	7668	586.700	TTX 7668AP (7668)	7668	
33	7669	586.725	TTX 7669AP (7669)	7669	
33	7670	586.750	TTX 7670AP (7670)	7670	
33	7671	586.775	TTX 7671AP (7671)	7671	
33	7672	586.800	TTX 7672AP (7672)	7672	
33	7673	586.825	TTX 7673AP (7673)	7673	
33	7674	586.850	TTX 7674AP (7674)	7674	
33	7675	586.875	TTX 7675AP (7675)	7675	
33	7676	586.900	TTX 7676AP (7676)	7676	
33	7677	586.925	TTX 7677AP (7677)	7677	
33	7678	586.950	TTX 7678AP (7678)	7678	
33	7679	586.975	TTX 7679AP (7679)	7679	
33	7680	587.000	TTX 7680AP (7680)	7680	
33	7681	587.025	TTX 7681AP (7681)	7681	
33	7682	587.050	TTX 7682AP (7682)	7682	
33	7683	587.075	TTX 7683AP (7683)	7683	
33	7684	587.100	TTX 7684AP (7684)	7684	
33	7685	587.125	TTX 7685AP (7685)	7685	
33	7686	587.150	TTX 7686AP (7686)	7686	
33	7687	587.175	TTX 7687AP (7687)	7687	
33	7688	587.200	TTX 7688AP (7688)	7688	
33	7689	587.225	TTX 7689AP (7689)	7689	
33	7690	587.250	TTX 7690AP (7690)	7690	
33	7691	587.275	TTX 7691AP (7691)	7691	
33	7692	587.300	TTX 7692AP (7692)	7692	
33	7693	587.325	TTX 7693AP (7693)	7693	
33	7694	587.350	TTX 7694AP (7694)	7694	
33	7695	587.375	TTX 7695AP (7695)	7695	
33	7696	587.400	TTX 7696AP (7696)	7696	
33	7697	587.425	TTX 7697AP (7697)	7697	
33	7698	587.450	TTX 7698AP (7698)	7698	
33	7699	587.475	TTX 7699AP (7699)	7699	
33	7700	587.500	TTX 7700AP (7700)	7700	
33	7701	587.525	TTX 7701AP (7701)	7701	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
33	7702	587.550	TTX 7702AP (7702)	7702	
33	7703	587.575	TTX 7703AP (7703)	7703	
33	7704	587.600	TTX 7704AP (7704)	7704	
33	7705	587.625	TTX 7705AP (7705)	7705	
33	7706	587.650	TTX 7706AP (7706)	7706	
33	7707	587.675	TTX 7707AP (7707)	7707	
33	7708	587.700	TTX 7708AP (7708)	7708	
33	7709	587.725	TTX 7709AP (7709)	7709	
33	7710	587.750	TTX 7710AP (7710)	7710	
33	7711	587.775	TTX 7711AP (7711)	7711	
33	7712	587.800	TTX 7712AP (7712)	7712	
33	7713	587.825	TTX 7713AP (7713)	7713	
33	7714	587.850	TTX 7714AP (7714)	7714	
33	7715	587.875	TTX 7715AP (7715)	7715	
33	7716	587.900	TTX 7716AP (7716)	7716	
33	7717	587.925	TTX 7717AP (7717)	7717	
33	7718	587.950	TTX 7718AP (7718)	7718	
33	7719	587.975	TTX 7719AP (7719)	7719	
33	7720	588.000	TTX 7720AP (7720)	7720	
33	7721	588.025	TTX 7721AP (7721)	7721	
33	7722	588.050	TTX 7722AP (7722)	7722	
33	7723	588.075	TTX 7723AP (7723)	7723	
33	7724	588.100	TTX 7724AP (7724)	7724	
33	7725	588.125	TTX 7725AP (7725)	7725	
33	7726	588.150	TTX 7726AP (7726)	7726	
33	7727	588.175	TTX 7727AP (7727)	7727	
33	7728	588.200	TTX 7728AP (7728)	7728	
33	7729	588.225	TTX 7729AP (7729)	7729	
33	7730	588.250	TTX 7730AP (7730)	7730	
33	7731	588.275	TTX 7731AP (7731)	7731	
33	7732	588.300	TTX 7732AP (7732)	7732	
33	7733	588.325	TTX 7733AP (7733)	7733	
33	7734	588.350	TTX 7734AP (7734)	7734	
33	7735	588.375	TTX 7735AP (7735)	7735	
33	7736	588.400	TTX 7736AP (7736)	7736	
33	7737	588.425	TTX 7737AP (7737)	7737	
33	7738	588.450	TTX 7738AP (7738)	7738	
33	7739	588.475	TTX 7739AP (7739)	7739	
33	7740	588.500	TTX 7740AP (7740)	7740	
33	7741	588.525	TTX 7741AP (7741)	7741	
33	7742	588.550	TTX 7742AP (7742)	7742	
33	7743	588.575	TTX 7743AP (7743)	7743	
33	7744	588.600	TTX 7744AP (7744)	7744	
33	7745	588.625	TTX 7745AP (7745)	7745	
33	7746	588.650	TTX 7746AP (7746)	7746	
33	7747	588.675	TTX 7747AP (7747)	7747	
33	7748	588.700	TTX 7748AP (7748)	7748	
33	7749	588.725	TTX 7749AP (7749)	7749	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
33	7750	588.750	TTX 7750AP (7750)	7750	
33	7751	588.775	TTX 7751AP (7751)	7751	
33	7752	588.800	TTX 7752AP (7752)	7752	
33	7753	588.825	TTX 7753AP (7753)	7753	
33	7754	588.850	TTX 7754AP (7754)	7754	
33	7755	588.875	TTX 7755AP (7755)	7755	
33	7756	588.900	TTX 7756AP (7756)	7756	
33	7757	588.925	TTX 7757AP (7757)	7757	
33	7758	588.950	TTX 7758AP (7758)	7758	
33	7759	588.975	TTX 7759AP (7759)	7759	
33	7760	589.000	TTX 7760AP (7760)	7760	
33	7761	589.025	TTX 7761AP (7761)	7761	
33	7762	589.050	TTX 7762AP (7762)	7762	
33	7763	589.075	TTX 7763AP (7763)	7763	
33	7764	589.100	TTX 7764AP (7764)	7764	
33	7765	589.125	TTX 7765AP (7765)	7765	
33	7766	589.150	TTX 7766AP (7766)	7766	
33	7767	589.175	TTX 7767AP (7767)	7767	
33	7768	589.200	TTX 7768AP (7768)	7768	
33	7769	589.225	TTX 7769AP (7769)	7769	
33	7770	589.250	TTX 7770AP (7770)	7770	
33	7771	589.275	TTX 7771AP (7771)	7771	
33	7772	589.300	TTX 7772AP (7772)	7772	
33	7773	589.325	TTX 7773AP (7773)	7773	
33	7774	589.350	TTX 7774AP (7774)	7774	
33	7775	589.375	TTX 7775AP (7775)	7775	
33	7776	589.400	TTX 7776AP (7776)	7776	
33	7777	589.425	TTX 7777AP (7777)	7777	
33	7778	589.450	TTX 7778AP (7778)	7778	
33	7779	589.475	TTX 7779AP (7779)	7779	
33	7780	589.500	TTX 7780AP (7780)	7780	
33	7781	589.525	TTX 7781AP (7781)	7781	
33	7782	589.550	TTX 7782AP (7782)	7782	
33	7783	589.575	TTX 7783AP (7783)	7783	
33	7784	589.600	TTX 7784AP (7784)	7784	
33	7785	589.625	TTX 7785AP (7785)	7785	
33	7786	589.650	TTX 7786AP (7786)	7786	
33	7787	589.675	TTX 7787AP (7787)	7787	
33	7788	589.700	TTX 7788AP (7788)	7788	
33	7789	589.725	TTX 7789AP (7789)	7789	
33	7790	589.750	TTX 7790AP (7790)	7790	
33	7791	589.775	TTX 7791AP (7791)	7791	
33	7792	589.800	TTX 7792AP (7792)	7792	
33	7793	589.825	TTX 7793AP (7793)	7793	
33	7794	589.850	TTX 7794AP (7794)	7794	
33	7795	589.875	TTX 7795AP (7795)	7795	
33	7796	589.900	TTX 7796AP (7796)	7796	
33	7797	589.925	TTX 7797AP (7797)	7797	
33	7798	589.950	TTX 7798AP (7798)	7798	
33	7799	589.975	TTX 7799AP (7799)	7799	
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34	7801	590.025	TTX 7801AP (7801)	7801	
34	7802	590.050	TTX 7802AP (7802)	7802	
34	7803	590.075	TTX 7803AP (7803)	7803	
34	7804	590.100	TTX 7804AP (7804)	7804	
34	7805	590.125	TTX 7805AP (7805)	7805	
34	7806	590.150	TTX 7806AP (7806)	7806	
34	7807	590.175	TTX 7807AP (7807)	7807	
34	7808	590.200	TTX 7808AP (7808)	7808	
34	7809	590.225	TTX 7809AP (7809)	7809	
34	7810	590.250	TTX 7810AP (7810)	7810	
34	7811	590.275	TTX 7811AP (7811)	7811	
34	7812	590.300	TTX 7812AP (7812)	7812	
34	7813	590.325	TTX 7813AP (7813)	7813	
34	7814	590.350	TTX 7814AP (7814)	7814	
34	7815	590.375	TTX 7815AP (7815)	7815	
34	7816	590.400	TTX 7816AP (7816)	7816	Reserved
34	7817	590.425	TTX 7817AP (7817)	7817	
34	7818	590.450	TTX 7818AP (7818)	7818	
34	7819	590.475	TTX 7819AP (7819)	7819	
34	7820	590.500	TTX 7820AP (7820)	7820	
34	7821	590.525	TTX 7821AP (7821)	7821	
34	7822	590.550	TTX 7822AP (7822)	7822	
34	7823	590.575	TTX 7823AP (7823)	7823	
34	7824	590.600	TTX 7824AP (7824)	7824	
34	7825	590.625	TTX 7825AP (7825)	7825	
34	7826	590.650	TTX 7826AP (7826)	7826	
34	7827	590.675	TTX 7827AP (7827)	7827	
34	7828	590.700	TTX 7828AP (7828)	7828	
34	7829	590.725	TTX 7829AP (7829)	7829	
34	7830	590.750	TTX 7830AP (7830)	7830	
34	7831	590.775	TTX 7831AP (7831)	7831	
34	7832	590.800	TTX 7832AP (7832)	7832	
34	7833	590.825	TTX 7833AP (7833)	7833	
34	7834	590.850	TTX 7834AP (7834)	7834	
34	7835	590.875	TTX 7835AP (7835)	7835	
34	7836	590.900	TTX 7836AP (7836)	7836	
34	7837	590.925	TTX 7837AP (7837)	7837	
34	7838	590.950	TTX 7838AP (7838)	7838	
34	7839	590.975	TTX 7839AP (7839)	7839	
34	7840	591.000	TTX 7840AP (7840)	7840	
34	7841	591.025	TTX 7841AP (7841)	7841	
34	7842	591.050	TTX 7842AP (7842)	7842	
34	7843	591.075	TTX 7843AP (7843)	7843	
34	7844	591.100	TTX 7844AP (7844)	7844	
34	7845	591.125	TTX 7845AP (7845)	7845	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
34	7846	591.150	TTX 7846AP (7846)	7846	
34	7847	591.175	TTX 7847AP (7847)	7847	
34	7848	591.200	TTX 7848AP (7848)	7848	
34	7849	591.225	TTX 7849AP (7849)	7849	
34	7850	591.250	TTX 7850AP (7850)	7850	
34	7851	591.275	TTX 7851AP (7851)	7851	
34	7852	591.300	TTX 7852AP (7852)	7852	
34	7853	591.325	TTX 7853AP (7853)	7853	
34	7854	591.350	TTX 7854AP (7854)	7854	
34	7855	591.375	TTX 7855AP (7855)	7855	
34	7856	591.400	TTX 7856AP (7856)	7856	
34	7857	591.425	TTX 7857AP (7857)	7857	
34	7858	591.450	TTX 7858AP (7858)	7858	
34	7859	591.475	TTX 7859AP (7859)	7859	
34	7860	591.500	TTX 7860AP (7860)	7860	
34	7861	591.525	TTX 7861AP (7861)	7861	
34	7862	591.550	TTX 7862AP (7862)	7862	
34	7863	591.575	TTX 7863AP (7863)	7863	
34	7864	591.600	TTX 7864AP (7864)	7864	
34	7865	591.625	TTX 7865AP (7865)	7865	
34	7866	591.650	TTX 7866AP (7866)	7866	
34	7867	591.675	TTX 7867AP (7867)	7867	
34	7868	591.700	TTX 7868AP (7868)	7868	
34	7869	591.725	TTX 7869AP (7869)	7869	
34	7870	591.750	TTX 7870AP (7870)	7870	
34	7871	591.775	TTX 7871AP (7871)	7871	
34	7872	591.800	TTX 7872AP (7872)	7872	
34	7873	591.825	TTX 7873AP (7873)	7873	
34	7874	591.850	TTX 7874AP (7874)	7874	
34	7875	591.875	TTX 7875AP (7875)	7875	
34	7876	591.900	TTX 7876AP (7876)	7876	
34	7877	591.925	TTX 7877AP (7877)	7877	
34	7878	591.950	TTX 7878AP (7878)	7878	
34	7879	591.975	TTX 7879AP (7879)	7879	
34	7880	592.000	TTX 7880AP (7880)	7880	
34	7881	592.025	TTX 7881AP (7881)	7881	
34	7882	592.050	TTX 7882AP (7882)	7882	
34	7883	592.075	TTX 7883AP (7883)	7883	
34	7884	592.100	TTX 7884AP (7884)	7884	
34	7885	592.125	TTX 7885AP (7885)	7885	
34	7886	592.150	TTX 7886AP (7886)	7886	
34	7887	592.175	TTX 7887AP (7887)	7887	
34	7888	592.200	TTX 7888AP (7888)	7888	
34	7889	592.225	TTX 7889AP (7889)	7889	
34	7890	592.250	TTX 7890AP (7890)	7890	
34	7891	592.275	TTX 7891AP (7891)	7891	
34	7892	592.300	TTX 7892AP (7892)	7892	
34	7893	592.325	TTX 7893AP (7893)	7893	
34	7894	592.350	TTX 7894AP (7894)	7894	
34	7895	592.375	TTX 7895AP (7895)	7895	
34	7896	592.400	TTX 7896AP (7896)	7896	
34	7897	592.425	TTX 7897AP (7897)	7897	
34	7898	592.450	TTX 7898AP (7898)	7898	
34	7899	592.475	TTX 7899AP (7899)	7899	
34	7900	592.500	TTX 7900AP (7900)	7900	
34	7901	592.525	TTX 7901AP (7901)	7901	
34	7902	592.550	TTX 7902AP (7902)	7902	
34	7903	592.575	TTX 7903AP (7903)	7903	
34	7904	592.600	TTX 7904AP (7904)	7904	
34	7905	592.625	TTX 7905AP (7905)	7905	
34	7906	592.650	TTX 7906AP (7906)	7906	
34	7907	592.675	TTX 7907AP (7907)	7907	
34	7908	592.700	TTX 7908AP (7908)	7908	
34	7909	592.725	TTX 7909AP (7909)	7909	
34	7910	592.750	TTX 7910AP (7910)	7910	
34	7911	592.775	TTX 7911AP (7911)	7911	
34	7912	592.800	TTX 7912AP (7912)	7912	
34	7913	592.825	TTX 7913AP (7913)	7913	
34	7914	592.850	TTX 7914AP (7914)	7914	
34	7915	592.875	TTX 7915AP (7915)	7915	
34	7916	592.900	TTX 7916AP (7916)	7916	
34	7917	592.925	TTX 7917AP (7917)	7917	
34	7918	592.950	TTX 7918AP (7918)	7918	
34	7919	592.975	TTX 7919AP (7919)	7919	
34	7920	593.000	TTX 7920AP (7920)	7920	
34	7921	593.025	TTX 7921AP (7921)	7921	
34	7922	593.050	TTX 7922AP (7922)	7922	
34	7923	593.075	TTX 7923AP (7923)	7923	
34	7924	593.100	TTX 7924AP (7924)	7924	
34	7925	593.125	TTX 7925AP (7925)	7925	
34	7926	593.150	TTX 7926AP (7926)	7926	
34	7927	593.175	TTX 7927AP (7927)	7927	
34	7928	593.200	TTX 7928AP (7928)	7928	
34	7929	593.225	TTX 7929AP (7929)	7929	
34	7930	593.250	TTX 7930AP (7930)	7930	
34	7931	593.275	TTX 7931AP (7931)	7931	
34	7932	593.300	TTX 7932AP (7932)	7932	
34	7933	593.325	TTX 7933AP (7933)	7933	
34	7934	593.350	TTX 7934AP (7934)	7934	
34	7935	593.375	TTX 7935AP (7935)	7935	
34	7936	593.400	TTX 7936AP (7936)	7936	
34	7937	593.425	TTX 7937AP (7937)	7937	
34	7938	593.450	TTX 7938AP (7938)	7938	
34	7939	593.475	TTX 7939AP (7939)	7939	
34	7940	593.500	TTX 7940AP (7940)	7940	
34	7941	593.525	TTX 7941AP (7941)	7941	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
34	7942	593.550	TTX 7942AP (7942)	7942	
34	7943	593.575	TTX 7943AP (7943)	7943	
34	7944	593.600	TTX 7944AP (7944)	7944	
34	7945	593.625	TTX 7945AP (7945)	7945	
34	7946	593.650	TTX 7946AP (7946)	7946	
34	7947	593.675	TTX 7947AP (7947)	7947	
34	7948	593.700	TTX 7948AP (7948)	7948	
34	7949	593.725	TTX 7949AP (7949)	7949	
34	7950	593.750	TTX 7950AP (7950)	7950	
34	7951	593.775	TTX 7951AP (7951)	7951	
34	7952	593.800	TTX 7952AP (7952)	7952	
34	7953	593.825	TTX 7953AP (7953)	7953	
34	7954	593.850	TTX 7954AP (7954)	7954	
34	7955	593.875	TTX 7955AP (7955)	7955	
34	7956	593.900	TTX 7956AP (7956)	7956	
34	7957	593.925	TTX 7957AP (7957)	7957	
34	7958	593.950	TTX 7958AP (7958)	7958	
34	7959	593.975	TTX 7959AP (7959)	7959	
34	7960	594.000	TTX 7960AP (7960)	7960	
34	7961	594.025	TTX 7961AP (7961)	7961	
34	7962	594.050	TTX 7962AP (7962)	7962	
34	7963	594.075	TTX 7963AP (7963)	7963	
34	7964	594.100	TTX 7964AP (7964)	7964	
34	7965	594.125	TTX 7965AP (7965)	7965	
34	7966	594.150	TTX 7966AP (7966)	7966	
34	7967	594.175	TTX 7967AP (7967)	7967	
34	7968	594.200	TTX 7968AP (7968)	7968	
34	7969	594.225	TTX 7969AP (7969)	7969	
34	7970	594.250	TTX 7970AP (7970)	7970	
34	7971	594.275	TTX 7971AP (7971)	7971	
34	7972	594.300	TTX 7972AP (7972)	7972	
34	7973	594.325	TTX 7973AP (7973)	7973	
34	7974	594.350	TTX 7974AP (7974)	7974	
34	7975	594.375	TTX 7975AP (7975)	7975	
34	7976	594.400	TTX 7976AP (7976)	7976	
34	7977	594.425	TTX 7977AP (7977)	7977	
34	7978	594.450	TTX 7978AP (7978)	7978	
34	7979	594.475	TTX 7979AP (7979)	7979	
34	7980	594.500	TTX 7980AP (7980)	7980	
34	7981	594.525	TTX 7981AP (7981)	7981	
34	7982	594.550	TTX 7982AP (7982)	7982	
34	7983	594.575	TTX 7983AP (7983)	7983	
34	7984	594.600	TTX 7984AP (7984)	7984	
34	7985	594.625	TTX 7985AP (7985)	7985	
34	7986	594.650	TTX 7986AP (7986)	7986	
34	7987	594.675	TTX 7987AP (7987)	7987	
34	7988	594.700	TTX 7988AP (7988)	7988	
34	7989	594.725	TTX 7989AP (7989)	7989	
34	7990	594.750	TTX 7990AP (7990)	7990	
34	7991	594.775	TTX 7991AP (7991)	7991	
34	7992	594.800	TTX 7992AP (7992)	7992	
34	7993	594.825	TTX 7993AP (7993)	7993	
34	7994	594.850	TTX 7994AP (7994)	7994	
34	7995	594.875	TTX 7995AP (7995)	7995	
34	7996	594.900	TTX 7996AP (7996)	7996	
34	7997	594.925	TTX 7997AP (7997)	7997	
34	7998	594.950	TTX 7998AP (7998)	7998	
34	7999	594.975	TTX 7999AP (7999)	7999	
34	8000	595.000	TTX 8000AP (8000)	8000	
34	8001	595.025	TTX 8001AP (8001)	8001	
34	8002	595.050	TTX 8002AP (8002)	8002	
34	8003	595.075	TTX 8003AP (8003)	8003	
34	8004	595.100	TTX 8004AP (8004)	8004	
34	8005	595.125	TTX 8005AP (8005)	8005	
34	8006	595.150	TTX 8006AP (8006)	8006	
34	8007	595.175	TTX 8007AP (8007)	8007	
34	8008	595.200	TTX 8008AP (8008)	8008	
34	8009	595.225	TTX 8009AP (8009)	8009	
34	8010	595.250	TTX 8010AP (8010)	8010	
34	8011	595.275	TTX 8011AP (8011)	8011	
34	8012	595.300	TTX 8012AP (8012)	8012	
34	8013	595.325	TTX 8013AP (8013)	8013	
34	8014	595.350	TTX 8014AP (8014)	8014	
34	8015	595.375	TTX 8015AP (8015)	8015	
34	8016	595.400	TTX 8016AP (8016)	8016	
34	8017	595.425	TTX 8017AP (8017)	8017	
34	8018	595.450	TTX 8018AP (8018)	8018	
34	8019	595.475	TTX 8019AP (8019)	8019	
34	8020	595.500	TTX 8020AP (8020)	8020	
34	8021	595.525	TTX 8021AP (8021)	8021	
34	8022	595.550	TTX 8022AP (8022)	8022	
34	8023	595.575	TTX 8023AP (8023)	8023	
34	8024	595.600	TTX 8024AP (8024)	8024	
34	8025	595.625	TTX 8025AP (8025)	8025	
34	8026	595.650	TTX 8026AP (8026)	8026	
34	8027	595.675	TTX 8027AP (8027)	8027	
34	8028	595.700	TTX 8028AP (8028)	8028	
34	8029	595.725	TTX 8029AP (8029)	8029	
34	8030	595.750	TTX 8030AP (8030)	8030	
34	8031	595.775	TTX 8031AP (8031)	8031	
34	8032	595.800	TTX 8032AP (8032)	8032	
34	8033	595.825	TTX 8033AP (8033)	8033	
34	8034	595.850	TTX 8034AP (8034)	8034	
34	8035	595.875	TTX 8035AP (8035)	8035	
34	8036	595.900	TTX 8036AP (8036)	8036	
34	8037	595.925	TTX 8037AP (8037)	8037	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
34	8038	595.950	TTX 8038AP (8038)	8038	
34	8039	595.975	TTX 8039AP (8039)	8039	
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35	8041	596.025	TTX 8041AP (8041)	8041	
35	8042	596.050	TTX 8042AP (8042)	8042	
35	8043	596.075	TTX 8043AP (8043)	8043	
35	8044	596.100	TTX 8044AP (8044)	8044	
35	8045	596.125	TTX 8045AP (8045)	8045	
35	8046	596.150	TTX 8046AP (8046)	8046	
35	8047	596.175	TTX 8047AP (8047)	8047	
35	8048	596.200	TTX 8048AP (8048)	8048	
35	8049	596.225	TTX 8049AP (8049)	8049	
35	8050	596.250	TTX 8050AP (8050)	8050	
35	8051	596.275	TTX 8051AP (8051)	8051	
35	8052	596.300	TTX 8052AP (8052)	8052	
35	8053	596.325	TTX 8053AP (8053)	8053	
35	8054	596.350	TTX 8054AP (8054)	8054	
35	8055	596.375	TTX 8055AP (8055)	8055	
35	8056	596.400	TTX 8056AP (8056)	8056	
35	8057	596.425	TTX 8057AP (8057)	8057	
35	8058	596.450	TTX 8058AP (8058)	8058	
35	8059	596.475	TTX 8059AP (8059)	8059	
35	8060	596.500	TTX 8060AP (8060)	8060	
35	8061	596.525	TTX 8061AP (8061)	8061	
35	8062	596.550	TTX 8062AP (8062)	8062	
35	8063	596.575	TTX 8063AP (8063)	8063	
35	8064	596.600	TTX 8064AP (8064)	8064	
35	8065	596.625	TTX 8065AP (8065)	8065	
35	8066	596.650	TTX 8066AP (8066)	8066	
35	8067	596.675	TTX 8067AP (8067)	8067	
35	8068	596.700	TTX 8068AP (8068)	8068	
35	8069	596.725	TTX 8069AP (8069)	8069	
35	8070	596.750	TTX 8070AP (8070)	8070	
35	8071	596.775	TTX 8071AP (8071)	8071	
35	8072	596.800	TTX 8072AP (8072)	8072	
35	8073	596.825	TTX 8073AP (8073)	8073	
35	8074	596.850	TTX 8074AP (8074)	8074	
35	8075	596.875	TTX 8075AP (8075)	8075	
35	8076	596.900	TTX 8076AP (8076)	8076	
35	8077	596.925	TTX 8077AP (8077)	8077	
35	8078	596.950	TTX 8078AP (8078)	8078	
35	8079	596.975	TTX 8079AP (8079)	8079	
35	8080	597.000	TTX 8080AP (8080)	8080	
35	8081	597.025	TTX 8081AP (8081)	8081	
35	8082	597.050	TTX 8082AP (8082)	8082	
35	8083	597.075	TTX 8083AP (8083)	8083	
35	8084	597.100	TTX 8084AP (8084)	8084	
35	8085	597.125	TTX 8085AP (8085)	8085	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
35	8086	597.150	TTX 8086AP (8086)	8086	
35	8087	597.175	TTX 8087AP (8087)	8087	
35	8088	597.200	TTX 8088AP (8088)	8088	
35	8089	597.225	TTX 8089AP (8089)	8089	
35	8090	597.250	TTX 8090AP (8090)	8090	
35	8091	597.275	TTX 8091AP (8091)	8091	
35	8092	597.300	TTX 8092AP (8092)	8092	
35	8093	597.325	TTX 8093AP (8093)	8093	
35	8094	597.350	TTX 8094AP (8094)	8094	
35	8095	597.375	TTX 8095AP (8095)	8095	
35	8096	597.400	TTX 8096AP (8096)	8096	
35	8097	597.425	TTX 8097AP (8097)	8097	
35	8098	597.450	TTX 8098AP (8098)	8098	
35	8099	597.475	TTX 8099AP (8099)	8099	
35	8100	597.500	TTX 8100AP (8100)	8100	
35	8101	597.525	TTX 8101AP (8101)	8101	
35	8102	597.550	TTX 8102AP (8102)	8102	
35	8103	597.575	TTX 8103AP (8103)	8103	
35	8104	597.600	TTX 8104AP (8104)	8104	
35	8105	597.625	TTX 8105AP (8105)	8105	
35	8106	597.650	TTX 8106AP (8106)	8106	
35	8107	597.675	TTX 8107AP (8107)	8107	
35	8108	597.700	TTX 8108AP (8108)	8108	
35	8109	597.725	TTX 8109AP (8109)	8109	
35	8110	597.750	TTX 8110AP (8110)	8110	
35	8111	597.775	TTX 8111AP (8111)	8111	
35	8112	597.800	TTX 8112AP (8112)	8112	
35	8113	597.825	TTX 8113AP (8113)	8113	
35	8114	597.850	TTX 8114AP (8114)	8114	
35	8115	597.875	TTX 8115AP (8115)	8115	
35	8116	597.900	TTX 8116AP (8116)	8116	
35	8117	597.925	TTX 8117AP (8117)	8117	
35	8118	597.950	TTX 8118AP (8118)	8118	
35	8119	597.975	TTX 8119AP (8119)	8119	
35	8120	598.000	TTX 8120AP (8120)	8120	
35	8121	598.025	TTX 8121AP (8121)	8121	
35	8122	598.050	TTX 8122AP (8122)	8122	
35	8123	598.075	TTX 8123AP (8123)	8123	
35	8124	598.100	TTX 8124AP (8124)	8124	
35	8125	598.125	TTX 8125AP (8125)	8125	
35	8126	598.150	TTX 8126AP (8126)	8126	
35	8127	598.175	TTX 8127AP (8127)	8127	
35	8128	598.200	TTX 8128AP (8128)	8128	
35	8129	598.225	TTX 8129AP (8129)	8129	
35	8130	598.250	TTX 8130AP (8130)	8130	
35	8131	598.275	TTX 8131AP (8131)	8131	
35	8132	598.300	TTX 8132AP (8132)	8132	
35	8133	598.325	TTX 8133AP (8133)	8133	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
35	8134	598.350	TTX 8134AP (8134)	8134	
35	8135	598.375	TTX 8135AP (8135)	8135	
35	8136	598.400	TTX 8136AP (8136)	8136	
35	8137	598.425	TTX 8137AP (8137)	8137	
35	8138	598.450	TTX 8138AP (8138)	8138	
35	8139	598.475	TTX 8139AP (8139)	8139	
35	8140	598.500	TTX 8140AP (8140)	8140	
35	8141	598.525	TTX 8141AP (8141)	8141	
35	8142	598.550	TTX 8142AP (8142)	8142	
35	8143	598.575	TTX 8143AP (8143)	8143	
35	8144	598.600	TTX 8144AP (8144)	8144	
35	8145	598.625	TTX 8145AP (8145)	8145	
35	8146	598.650	TTX 8146AP (8146)	8146	
35	8147	598.675	TTX 8147AP (8147)	8147	
35	8148	598.700	TTX 8148AP (8148)	8148	
35	8149	598.725	TTX 8149AP (8149)	8149	
35	8150	598.750	TTX 8150AP (8150)	8150	
35	8151	598.775	TTX 8151AP (8151)	8151	
35	8152	598.800	TTX 8152AP (8152)	8152	
35	8153	598.825	TTX 8153AP (8153)	8153	
35	8154	598.850	TTX 8154AP (8154)	8154	
35	8155	598.875	TTX 8155AP (8155)	8155	
35	8156	598.900	TTX 8156AP (8156)	8156	
35	8157	598.925	TTX 8157AP (8157)	8157	
35	8158	598.950	TTX 8158AP (8158)	8158	
35	8159	598.975	TTX 8159AP (8159)	8159	
35	8160	599.000	TTX 8160AP (8160)	8160	
35	8161	599.025	TTX 8161AP (8161)	8161	
35	8162	599.050	TTX 8162AP (8162)	8162	
35	8163	599.075	TTX 8163AP (8163)	8163	
35	8164	599.100	TTX 8164AP (8164)	8164	
35	8165	599.125	TTX 8165AP (8165)	8165	
35	8166	599.150	TTX 8166AP (8166)	8166	
35	8167	599.175	TTX 8167AP (8167)	8167	
35	8168	599.200	TTX 8168AP (8168)	8168	
35	8169	599.225	TTX 8169AP (8169)	8169	
35	8170	599.250	TTX 8170AP (8170)	8170	
35	8171	599.275	TTX 8171AP (8171)	8171	
35	8172	599.300	TTX 8172AP (8172)	8172	
35	8173	599.325	TTX 8173AP (8173)	8173	
35	8174	599.350	TTX 8174AP (8174)	8174	
35	8175	599.375	TTX 8175AP (8175)	8175	
35	8176	599.400	TTX 8176AP (8176)	8176	
35	8177	599.425	TTX 8177AP (8177)	8177	
35	8178	599.450	TTX 8178AP (8178)	8178	
35	8179	599.475	TTX 8179AP (8179)	8179	
35	8180	599.500	TTX 8180AP (8180)	8180	
35	8181	599.525	TTX 8181AP (8181)	8181	
35	8182	599.550	TTX 8182AP (8182)	8182	
35	8183	599.575	TTX 8183AP (8183)	8183	
35	8184	599.600	TTX 8184AP (8184)	8184	
35	8185	599.625	TTX 8185AP (8185)	8185	
35	8186	599.650	TTX 8186AP (8186)	8186	
35	8187	599.675	TTX 8187AP (8187)	8187	
35	8188	599.700	TTX 8188AP (8188)	8188	
35	8189	599.725	TTX 8189AP (8189)	8189	
35	8190	599.750	TTX 8190AP (8190)	8190	
35	8191	599.775	TTX 8191AP (8191)	8191	
35	8192	599.800	TTX 8192AP (8192)	8192	
35	8193	599.825	TTX 8193AP (8193)	8193	
35	8194	599.850	TTX 8194AP (8194)	8194	
35	8195	599.875	TTX 8195AP (8195)	8195	
35	8196	599.900	TTX 8196AP (8196)	8196	
35	8197	599.925	TTX 8197AP (8197)	8197	
35	8198	599.950	TTX 8198AP (8198)	8198	
35	8199	599.975	TTX 8199AP (8199)	8199	
35	8200	600.000	TTX 8200AP (8200)	8200	Reserved
35	8201	600.025	TTX 8201AP (8201)	8201	
35	8202	600.050	TTX 8202AP (8202)	8202	
35	8203	600.075	TTX 8203AP (8203)	8203	
35	8204	600.100	TTX 8204AP (8204)	8204	
35	8205	600.125	TTX 8205AP (8205)	8205	
35	8206	600.150	TTX 8206AP (8206)	8206	
35	8207	600.175	TTX 8207AP (8207)	8207	
35	8208	600.200	TTX 8208AP (8208)	8208	
35	8209	600.225	TTX 8209AP (8209)	8209	
35	8210	600.250	TTX 8210AP (8210)	8210	
35	8211	600.275	TTX 8211AP (8211)	8211	
35	8212	600.300	TTX 8212AP (8212)	8212	
35	8213	600.325	TTX 8213AP (8213)	8213	
35	8214	600.350	TTX 8214AP (8214)	8214	
35	8215	600.375	TTX 8215AP (8215)	8215	
35	8216	600.400	TTX 8216AP (8216)	8216	
35	8217	600.425	TTX 8217AP (8217)	8217	
35	8218	600.450	TTX 8218AP (8218)	8218	
35	8219	600.475	TTX 8219AP (8219)	8219	
35	8220	600.500	TTX 8220AP (8220)	8220	
35	8221	600.525	TTX 8221AP (8221)	8221	
35	8222	600.550	TTX 8222AP (8222)	8222	
35	8223	600.575	TTX 8223AP (8223)	8223	
35	8224	600.600	TTX 8224AP (8224)	8224	
35	8225	600.625	TTX 8225AP (8225)	8225	
35	8226	600.650	TTX 8226AP (8226)	8226	
35	8227	600.675	TTX 8227AP (8227)	8227	
35	8228	600.700	TTX 8228AP (8228)	8228	
35	8229	600.725	TTX 8229AP (8229)	8229	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
35	8230	600.750	TTX 8230AP (8230)	8230	
35	8231	600.775	TTX 8231AP (8231)	8231	
35	8232	600.800	TTX 8232AP (8232)	8232	
35	8233	600.825	TTX 8233AP (8233)	8233	
35	8234	600.850	TTX 8234AP (8234)	8234	
35	8235	600.875	TTX 8235AP (8235)	8235	
35	8236	600.900	TTX 8236AP (8236)	8236	
35	8237	600.925	TTX 8237AP (8237)	8237	
35	8238	600.950	TTX 8238AP (8238)	8238	
35	8239	600.975	TTX 8239AP (8239)	8239	
35	8240	601.000	TTX 8240AP (8240)	8240	
35	8241	601.025	TTX 8241AP (8241)	8241	
35	8242	601.050	TTX 8242AP (8242)	8242	
35	8243	601.075	TTX 8243AP (8243)	8243	
35	8244	601.100	TTX 8244AP (8244)	8244	
35	8245	601.125	TTX 8245AP (8245)	8245	
35	8246	601.150	TTX 8246AP (8246)	8246	
35	8247	601.175	TTX 8247AP (8247)	8247	
35	8248	601.200	TTX 8248AP (8248)	8248	
35	8249	601.225	TTX 8249AP (8249)	8249	
35	8250	601.250	TTX 8250AP (8250)	8250	
35	8251	601.275	TTX 8251AP (8251)	8251	
35	8252	601.300	TTX 8252AP (8252)	8252	
35	8253	601.325	TTX 8253AP (8253)	8253	
35	8254	601.350	TTX 8254AP (8254)	8254	
35	8255	601.375	TTX 8255AP (8255)	8255	
35	8256	601.400	TTX 8256AP (8256)	8256	
35	8257	601.425	TTX 8257AP (8257)	8257	
35	8258	601.450	TTX 8258AP (8258)	8258	
35	8259	601.475	TTX 8259AP (8259)	8259	
35	8260	601.500	TTX 8260AP (8260)	8260	
35	8261	601.525	TTX 8261AP (8261)	8261	
35	8262	601.550	TTX 8262AP (8262)	8262	
35	8263	601.575	TTX 8263AP (8263)	8263	
35	8264	601.600	TTX 8264AP (8264)	8264	
35	8265	601.625	TTX 8265AP (8265)	8265	
35	8266	601.650	TTX 8266AP (8266)	8266	
35	8267	601.675	TTX 8267AP (8267)	8267	
35	8268	601.700	TTX 8268AP (8268)	8268	
35	8269	601.725	TTX 8269AP (8269)	8269	
35	8270	601.750	TTX 8270AP (8270)	8270	
35	8271	601.775	TTX 8271AP (8271)	8271	
35	8272	601.800	TTX 8272AP (8272)	8272	
35	8273	601.825	TTX 8273AP (8273)	8273	
35	8274	601.850	TTX 8274AP (8274)	8274	
35	8275	601.875	TTX 8275AP (8275)	8275	
35	8276	601.900	TTX 8276AP (8276)	8276	
35	8277	601.925	TTX 8277AP (8277)	8277	
35	8278	601.950	TTX 8278AP (8278)	8278	
35	8279	601.975	TTX 8279AP (8279)	8279	
…					
36	8281	602.025	TTX 8281AP (8281)	8281	
36	8282	602.050	TTX 8282AP (8282)	8282	
36	8283	602.075	TTX 8283AP (8283)	8283	
36	8284	602.100	TTX 8284AP (8284)	8284	
36	8285	602.125	TTX 8285AP (8285)	8285	
36	8286	602.150	TTX 8286AP (8286)	8286	
36	8287	602.175	TTX 8287AP (8287)	8287	
36	8288	602.200	TTX 8288AP (8288)	8288	
36	8289	602.225	TTX 8289AP (8289)	8289	
36	8290	602.250	TTX 8290AP (8290)	8290	
36	8291	602.275	TTX 8291AP (8291)	8291	
36	8292	602.300	TTX 8292AP (8292)	8292	
36	8293	602.325	TTX 8293AP (8293)	8293	
36	8294	602.350	TTX 8294AP (8294)	8294	
36	8295	602.375	TTX 8295AP (8295)	8295	
36	8296	602.400	TTX 8296AP (8296)	8296	
36	8297	602.425	TTX 8297AP (8297)	8297	
36	8298	602.450	TTX 8298AP (8298)	8298	
36	8299	602.475	TTX 8299AP (8299)	8299	
36	8300	602.500	TTX 8300AP (8300)	8300	
36	8301	602.525	TTX 8301AP (8301)	8301	
36	8302	602.550	TTX 8302AP (8302)	8302	
36	8303	602.575	TTX 8303AP (8303)	8303	
36	8304	602.600	TTX 8304AP (8304)	8304	
36	8305	602.625	TTX 8305AP (8305)	8305	
36	8306	602.650	TTX 8306AP (8306)	8306	
36	8307	602.675	TTX 8307AP (8307)	8307	
36	8308	602.700	TTX 8308AP (8308)	8308	
36	8309	602.725	TTX 8309AP (8309)	8309	
36	8310	602.750	TTX 8310AP (8310)	8310	
36	8311	602.775	TTX 8311AP (8311)	8311	
36	8312	602.800	TTX 8312AP (8312)	8312	
36	8313	602.825	TTX 8313AP (8313)	8313	
36	8314	602.850	TTX 8314AP (8314)	8314	
36	8315	602.875	TTX 8315AP (8315)	8315	
36	8316	602.900	TTX 8316AP (8316)	8316	
36	8317	602.925	TTX 8317AP (8317)	8317	
36	8318	602.950	TTX 8318AP (8318)	8318	
36	8319	602.975	TTX 8319AP (8319)	8319	
36	8320	603.000	TTX 8320AP (8320)	8320	
36	8321	603.025	TTX 8321AP (8321)	8321	
36	8322	603.050	TTX 8322AP (8322)	8322	
36	8323	603.075	TTX 8323AP (8323)	8323	
36	8324	603.100	TTX 8324AP (8324)	8324	
36	8325	603.125	TTX 8325AP (8325)	8325	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
36	8326	603.150	TTX 8326AP (8326)	8326	
36	8327	603.175	TTX 8327AP (8327)	8327	
36	8328	603.200	TTX 8328AP (8328)	8328	Reserved
36	8329	603.225	TTX 8329AP (8329)	8329	
36	8330	603.250	TTX 8330AP (8330)	8330	
36	8331	603.275	TTX 8331AP (8331)	8331	
36	8332	603.300	TTX 8332AP (8332)	8332	
36	8333	603.325	TTX 8333AP (8333)	8333	
36	8334	603.350	TTX 8334AP (8334)	8334	
36	8335	603.375	TTX 8335AP (8335)	8335	
36	8336	603.400	TTX 8336AP (8336)	8336	
36	8337	603.425	TTX 8337AP (8337)	8337	
36	8338	603.450	TTX 8338AP (8338)	8338	
36	8339	603.475	TTX 8339AP (8339)	8339	
36	8340	603.500	TTX 8340AP (8340)	8340	
36	8341	603.525	TTX 8341AP (8341)	8341	
36	8342	603.550	TTX 8342AP (8342)	8342	
36	8343	603.575	TTX 8343AP (8343)	8343	
36	8344	603.600	TTX 8344AP (8344)	8344	
36	8345	603.625	TTX 8345AP (8345)	8345	
36	8346	603.650	TTX 8346AP (8346)	8346	
36	8347	603.675	TTX 8347AP (8347)	8347	
36	8348	603.700	TTX 8348AP (8348)	8348	
36	8349	603.725	TTX 8349AP (8349)	8349	
36	8350	603.750	TTX 8350AP (8350)	8350	
36	8351	603.775	TTX 8351AP (8351)	8351	
36	8352	603.800	TTX 8352AP (8352)	8352	
36	8353	603.825	TTX 8353AP (8353)	8353	
36	8354	603.850	TTX 8354AP (8354)	8354	
36	8355	603.875	TTX 8355AP (8355)	8355	
36	8356	603.900	TTX 8356AP (8356)	8356	
36	8357	603.925	TTX 8357AP (8357)	8357	
36	8358	603.950	TTX 8358AP (8358)	8358	
36	8359	603.975	TTX 8359AP (8359)	8359	
36	8360	604.000	TTX 8360AP (8360)	8360	
36	8361	604.025	TTX 8361AP (8361)	8361	
36	8362	604.050	TTX 8362AP (8362)	8362	
36	8363	604.075	TTX 8363AP (8363)	8363	
36	8364	604.100	TTX 8364AP (8364)	8364	
36	8365	604.125	TTX 8365AP (8365)	8365	
36	8366	604.150	TTX 8366AP (8366)	8366	
36	8367	604.175	TTX 8367AP (8367)	8367	
36	8368	604.200	TTX 8368AP (8368)	8368	
36	8369	604.225	TTX 8369AP (8369)	8369	
36	8370	604.250	TTX 8370AP (8370)	8370	
36	8371	604.275	TTX 8371AP (8371)	8371	
36	8372	604.300	TTX 8372AP (8372)	8372	
36	8373	604.325	TTX 8373AP (8373)	8373	
36	8374	604.350	TTX 8374AP (8374)	8374	
36	8375	604.375	TTX 8375AP (8375)	8375	
36	8376	604.400	TTX 8376AP (8376)	8376	
36	8377	604.425	TTX 8377AP (8377)	8377	
36	8378	604.450	TTX 8378AP (8378)	8378	
36	8379	604.475	TTX 8379AP (8379)	8379	
36	8380	604.500	TTX 8380AP (8380)	8380	
36	8381	604.525	TTX 8381AP (8381)	8381	
36	8382	604.550	TTX 8382AP (8382)	8382	
36	8383	604.575	TTX 8383AP (8383)	8383	
36	8384	604.600	TTX 8384AP (8384)	8384	
36	8385	604.625	TTX 8385AP (8385)	8385	
36	8386	604.650	TTX 8386AP (8386)	8386	
36	8387	604.675	TTX 8387AP (8387)	8387	
36	8388	604.700	TTX 8388AP (8388)	8388	
36	8389	604.725	TTX 8389AP (8389)	8389	
36	8390	604.750	TTX 8390AP (8390)	8390	
36	8391	604.775	TTX 8391AP (8391)	8391	
36	8392	604.800	TTX 8392AP (8392)	8392	Reserved
36	8393	604.825	TTX 8393AP (8393)	8393	
36	8394	604.850	TTX 8394AP (8394)	8394	
36	8395	604.875	TTX 8395AP (8395)	8395	
36	8396	604.900	TTX 8396AP (8396)	8396	
36	8397	604.925	TTX 8397AP (8397)	8397	
36	8398	604.950	TTX 8398AP (8398)	8398	
36	8399	604.975	TTX 8399AP (8399)	8399	
36	8400	605.000	TTX 8400AP (8400)	8400	
36	8401	605.025	TTX 8401AP (8401)	8401	
36	8402	605.050	TTX 8402AP (8402)	8402	
36	8403	605.075	TTX 8403AP (8403)	8403	
36	8404	605.100	TTX 8404AP (8404)	8404	
36	8405	605.125	TTX 8405AP (8405)	8405	
36	8406	605.150	TTX 8406AP (8406)	8406	
36	8407	605.175	TTX 8407AP (8407)	8407	
36	8408	605.200	TTX 8408AP (8408)	8408	
36	8409	605.225	TTX 8409AP (8409)	8409	
36	8410	605.250	TTX 8410AP (8410)	8410	
36	8411	605.275	TTX 8411AP (8411)	8411	
36	8412	605.300	TTX 8412AP (8412)	8412	
36	8413	605.325	TTX 8413AP (8413)	8413	
36	8414	605.350	TTX 8414AP (8414)	8414	
36	8415	605.375	TTX 8415AP (8415)	8415	
36	8416	605.400	TTX 8416AP (8416)	8416	
36	8417	605.425	TTX 8417AP (8417)	8417	
36	8418	605.450	TTX 8418AP (8418)	8418	
36	8419	605.475	TTX 8419AP (8419)	8419	
36	8420	605.500	TTX 8420AP (8420)	8420	
36	8421	605.525	TTX 8421AP (8421)	8421	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
36	8422	605.550	TTX 8422AP (8422)	8422	
36	8423	605.575	TTX 8423AP (8423)	8423	
36	8424	605.600	TTX 8424AP (8424)	8424	
36	8425	605.625	TTX 8425AP (8425)	8425	
36	8426	605.650	TTX 8426AP (8426)	8426	
36	8427	605.675	TTX 8427AP (8427)	8427	
36	8428	605.700	TTX 8428AP (8428)	8428	
36	8429	605.725	TTX 8429AP (8429)	8429	
36	8430	605.750	TTX 8430AP (8430)	8430	
36	8431	605.775	TTX 8431AP (8431)	8431	
36	8432	605.800	TTX 8432AP (8432)	8432	
36	8433	605.825	TTX 8433AP (8433)	8433	
36	8434	605.850	TTX 8434AP (8434)	8434	
36	8435	605.875	TTX 8435AP (8435)	8435	
36	8436	605.900	TTX 8436AP (8436)	8436	
36	8437	605.925	TTX 8437AP (8437)	8437	
36	8438	605.950	TTX 8438AP (8438)	8438	
36	8439	605.975	TTX 8439AP (8439)	8439	
36	8440	606.000	TTX 8440AP (8440)	8440	
36	8441	606.025	TTX 8441AP (8441)	8441	
36	8442	606.050	TTX 8442AP (8442)	8442	
36	8443	606.075	TTX 8443AP (8443)	8443	
36	8444	606.100	TTX 8444AP (8444)	8444	
36	8445	606.125	TTX 8445AP (8445)	8445	
36	8446	606.150	TTX 8446AP (8446)	8446	
36	8447	606.175	TTX 8447AP (8447)	8447	
36	8448	606.200	TTX 8448AP (8448)	8448	
36	8449	606.225	TTX 8449AP (8449)	8449	
36	8450	606.250	TTX 8450AP (8450)	8450	
36	8451	606.275	TTX 8451AP (8451)	8451	
36	8452	606.300	TTX 8452AP (8452)	8452	
36	8453	606.325	TTX 8453AP (8453)	8453	
36	8454	606.350	TTX 8454AP (8454)	8454	
36	8455	606.375	TTX 8455AP (8455)	8455	
36	8456	606.400	TTX 8456AP (8456)	8456	
36	8457	606.425	TTX 8457AP (8457)	8457	
36	8458	606.450	TTX 8458AP (8458)	8458	
36	8459	606.475	TTX 8459AP (8459)	8459	
36	8460	606.500	TTX 8460AP (8460)	8460	
36	8461	606.525	TTX 8461AP (8461)	8461	
36	8462	606.550	TTX 8462AP (8462)	8462	
36	8463	606.575	TTX 8463AP (8463)	8463	
36	8464	606.600	TTX 8464AP (8464)	8464	
36	8465	606.625	TTX 8465AP (8465)	8465	
36	8466	606.650	TTX 8466AP (8466)	8466	
36	8467	606.675	TTX 8467AP (8467)	8467	
36	8468	606.700	TTX 8468AP (8468)	8468	
36	8469	606.725	TTX 8469AP (8469)	8469	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
36	8470	606.750	TTX 8470AP (8470)	8470	
36	8471	606.775	TTX 8471AP (8471)	8471	
36	8472	606.800	TTX 8472AP (8472)	8472	
36	8473	606.825	TTX 8473AP (8473)	8473	
36	8474	606.850	TTX 8474AP (8474)	8474	
36	8475	606.875	TTX 8475AP (8475)	8475	
36	8476	606.900	TTX 8476AP (8476)	8476	
36	8477	606.925	TTX 8477AP (8477)	8477	
36	8478	606.950	TTX 8478AP (8478)	8478	
36	8479	606.975	TTX 8479AP (8479)	8479	
36	8480	607.000	TTX 8480AP (8480)	8480	
36	8481	607.025	TTX 8481AP (8481)	8481	
36	8482	607.050	TTX 8482AP (8482)	8482	
36	8483	607.075	TTX 8483AP (8483)	8483	
36	8484	607.100	TTX 8484AP (8484)	8484	
36	8485	607.125	TTX 8485AP (8485)	8485	
36	8486	607.150	TTX 8486AP (8486)	8486	
36	8487	607.175	TTX 8487AP (8487)	8487	
36	8488	607.200	TTX 8488AP (8488)	8488	
36	8489	607.225	TTX 8489AP (8489)	8489	
36	8490	607.250	TTX 8490AP (8490)	8490	
36	8491	607.275	TTX 8491AP (8491)	8491	
36	8492	607.300	TTX 8492AP (8492)	8492	
36	8493	607.325	TTX 8493AP (8493)	8493	
36	8494	607.350	TTX 8494AP (8494)	8494	
36	8495	607.375	TTX 8495AP (8495)	8495	
36	8496	607.400	TTX 8496AP (8496)	8496	
36	8497	607.425	TTX 8497AP (8497)	8497	
36	8498	607.450	TTX 8498AP (8498)	8498	
36	8499	607.475	TTX 8499AP (8499)	8499	
36	8500	607.500	TTX 8500AP (8500)	8500	
36	8501	607.525	TTX 8501AP (8501)	8501	
36	8502	607.550	TTX 8502AP (8502)	8502	
36	8503	607.575	TTX 8503AP (8503)	8503	
36	8504	607.600	TTX 8504AP (8504)	8504	
36	8505	607.625	TTX 8505AP (8505)	8505	
36	8506	607.650	TTX 8506AP (8506)	8506	
36	8507	607.675	TTX 8507AP (8507)	8507	
36	8508	607.700	TTX 8508AP (8508)	8508	Reserved
36	8509	607.725	TTX 8509AP (8509)	8509	
36	8510	607.750	TTX 8510AP (8510)	8510	
36	8511	607.775	TTX 8511AP (8511)	8511	
36	8512	607.800	TTX 8512AP (8512)	8512	
36	8513	607.825	TTX 8513AP (8513)	8513	
36	8514	607.850	TTX 8514AP (8514)	8514	
36	8515	607.875	TTX 8515AP (8515)	8515	
36	8516	607.900	TTX 8516AP (8516)	8516	
36	8517	607.925	TTX 8517AP (8517)	8517	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
36	8518	607.950	TTX 8518AP (8518)	8518	
36	8519	607.975	TTX 8519AP (8519)	8519	
…					
37	8521	608.025	TTX 8521AP (8521)	8521	
37	8522	608.050	TTX 8522AP (8522)	8522	
37	8523	608.075	TTX 8523AP (8523)	8523	
37	8524	608.100	TTX 8524AP (8524)	8524	
37	8525	608.125	TTX 8525AP (8525)	8525	
37	8526	608.150	TTX 8526AP (8526)	8526	
37	8527	608.175	TTX 8527AP (8527)	8527	
37	8528	608.200	TTX 8528AP (8528)	8528	
37	8529	608.225	TTX 8529AP (8529)	8529	
37	8530	608.250	TTX 8530AP (8530)	8530	
37	8531	608.275	TTX 8531AP (8531)	8531	
37	8532	608.300	TTX 8532AP (8532)	8532	
37	8533	608.325	TTX 8533AP (8533)	8533	
37	8534	608.350	TTX 8534AP (8534)	8534	
37	8535	608.375	TTX 8535AP (8535)	8535	
37	8536	608.400	TTX 8536AP (8536)	8536	
37	8537	608.425	TTX 8537AP (8537)	8537	
37	8538	608.450	TTX 8538AP (8538)	8538	
37	8539	608.475	TTX 8539AP (8539)	8539	
37	8540	608.500	TTX 8540AP (8540)	8540	
37	8541	608.525	TTX 8541AP (8541)	8541	
37	8542	608.550	TTX 8542AP (8542)	8542	
37	8543	608.575	TTX 8543AP (8543)	8543	
37	8544	608.600	TTX 8544AP (8544)	8544	
37	8545	608.625	TTX 8545AP (8545)	8545	
37	8546	608.650	TTX 8546AP (8546)	8546	
37	8547	608.675	TTX 8547AP (8547)	8547	
37	8548	608.700	TTX 8548AP (8548)	8548	
37	8549	608.725	TTX 8549AP (8549)	8549	
37	8550	608.750	TTX 8550AP (8550)	8550	
37	8551	608.775	TTX 8551AP (8551)	8551	
37	8552	608.800	TTX 8552AP (8552)	8552	
37	8553	608.825	TTX 8553AP (8553)	8553	
37	8554	608.850	TTX 8554AP (8554)	8554	
37	8555	608.875	TTX 8555AP (8555)	8555	
37	8556	608.900	TTX 8556AP (8556)	8556	
37	8557	608.925	TTX 8557AP (8557)	8557	
37	8558	608.950	TTX 8558AP (8558)	8558	
37	8559	608.975	TTX 8559AP (8559)	8559	
37	8560	609.000	TTX 8560AP (8560)	8560	
37	8561	609.025	TTX 8561AP (8561)	8561	
37	8562	609.050	TTX 8562AP (8562)	8562	
37	8563	609.075	TTX 8563AP (8563)	8563	
37	8564	609.100	TTX 8564AP (8564)	8564	
37	8565	609.125	TTX 8565AP (8565)	8565	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
37	8566	609.150	TTX 8566AP (8566)	8566	
37	8567	609.175	TTX 8567AP (8567)	8567	
37	8568	609.200	TTX 8568AP (8568)	8568	
37	8569	609.225	TTX 8569AP (8569)	8569	
37	8570	609.250	TTX 8570AP (8570)	8570	
37	8571	609.275	TTX 8571AP (8571)	8571	
37	8572	609.300	TTX 8572AP (8572)	8572	
37	8573	609.325	TTX 8573AP (8573)	8573	
37	8574	609.350	TTX 8574AP (8574)	8574	
37	8575	609.375	TTX 8575AP (8575)	8575	
37	8576	609.400	TTX 8576AP (8576)	8576	
37	8577	609.425	TTX 8577AP (8577)	8577	
37	8578	609.450	TTX 8578AP (8578)	8578	
37	8579	609.475	TTX 8579AP (8579)	8579	
37	8580	609.500	TTX 8580AP (8580)	8580	
37	8581	609.525	TTX 8581AP (8581)	8581	
37	8582	609.550	TTX 8582AP (8582)	8582	
37	8583	609.575	TTX 8583AP (8583)	8583	
37	8584	609.600	TTX 8584AP (8584)	8584	
37	8585	609.625	TTX 8585AP (8585)	8585	
37	8586	609.650	TTX 8586AP (8586)	8586	
37	8587	609.675	TTX 8587AP (8587)	8587	
37	8588	609.700	TTX 8588AP (8588)	8588	
37	8589	609.725	TTX 8589AP (8589)	8589	
37	8590	609.750	TTX 8590AP (8590)	8590	
37	8591	609.775	TTX 8591AP (8591)	8591	
37	8592	609.800	TTX 8592AP (8592)	8592	
37	8593	609.825	TTX 8593AP (8593)	8593	
37	8594	609.850	TTX 8594AP (8594)	8594	
37	8595	609.875	TTX 8595AP (8595)	8595	
37	8596	609.900	TTX 8596AP (8596)	8596	
37	8597	609.925	TTX 8597AP (8597)	8597	
37	8598	609.950	TTX 8598AP (8598)	8598	
37	8599	609.975	TTX 8599AP (8599)	8599	
37	8600	610.000	TTX 8600AP (8600)	8600	Reserved
37	8601	610.025	TTX 8601AP (8601)	8601	
37	8602	610.050	TTX 8602AP (8602)	8602	
37	8603	610.075	TTX 8603AP (8603)	8603	
37	8604	610.100	TTX 8604AP (8604)	8604	
37	8605	610.125	TTX 8605AP (8605)	8605	
37	8606	610.150	TTX 8606AP (8606)	8606	
37	8607	610.175	TTX 8607AP (8607)	8607	
37	8608	610.200	TTX 8608AP (8608)	8608	
37	8609	610.225	TTX 8609AP (8609)	8609	
37	8610	610.250	TTX 8610AP (8610)	8610	
37	8611	610.275	TTX 8611AP (8611)	8611	
37	8612	610.300	TTX 8612AP (8612)	8612	
37	8613	610.325	TTX 8613AP (8613)	8613	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
37	8614	610.350	TTX 8614AP (8614)	8614	
37	8615	610.375	TTX 8615AP (8615)	8615	
37	8616	610.400	TTX 8616AP (8616)	8616	
37	8617	610.425	TTX 8617AP (8617)	8617	
37	8618	610.450	TTX 8618AP (8618)	8618	
37	8619	610.475	TTX 8619AP (8619)	8619	
37	8620	610.500	TTX 8620AP (8620)	8620	
37	8621	610.525	TTX 8621AP (8621)	8621	
37	8622	610.550	TTX 8622AP (8622)	8622	
37	8623	610.575	TTX 8623AP (8623)	8623	
37	8624	610.600	TTX 8624AP (8624)	8624	
37	8625	610.625	TTX 8625AP (8625)	8625	
37	8626	610.650	TTX 8626AP (8626)	8626	
37	8627	610.675	TTX 8627AP (8627)	8627	
37	8628	610.700	TTX 8628AP (8628)	8628	
37	8629	610.725	TTX 8629AP (8629)	8629	
37	8630	610.750	TTX 8630AP (8630)	8630	
37	8631	610.775	TTX 8631AP (8631)	8631	
37	8632	610.800	TTX 8632AP (8632)	8632	
37	8633	610.825	TTX 8633AP (8633)	8633	
37	8634	610.850	TTX 8634AP (8634)	8634	
37	8635	610.875	TTX 8635AP (8635)	8635	
37	8636	610.900	TTX 8636AP (8636)	8636	
37	8637	610.925	TTX 8637AP (8637)	8637	
37	8638	610.950	TTX 8638AP (8638)	8638	
37	8639	610.975	TTX 8639AP (8639)	8639	
37	8640	611.000	TTX 8640AP (8640)	8640	
37	8641	611.025	TTX 8641AP (8641)	8641	
37	8642	611.050	TTX 8642AP (8642)	8642	
37	8643	611.075	TTX 8643AP (8643)	8643	
37	8644	611.100	TTX 8644AP (8644)	8644	
37	8645	611.125	TTX 8645AP (8645)	8645	
37	8646	611.150	TTX 8646AP (8646)	8646	
37	8647	611.175	TTX 8647AP (8647)	8647	
37	8648	611.200	TTX 8648AP (8648)	8648	
37	8649	611.225	TTX 8649AP (8649)	8649	
37	8650	611.250	TTX 8650AP (8650)	8650	
37	8651	611.275	TTX 8651AP (8651)	8651	
37	8652	611.300	TTX 8652AP (8652)	8652	
37	8653	611.325	TTX 8653AP (8653)	8653	
37	8654	611.350	TTX 8654AP (8654)	8654	
37	8655	611.375	TTX 8655AP (8655)	8655	
37	8656	611.400	TTX 8656AP (8656)	8656	
37	8657	611.425	TTX 8657AP (8657)	8657	
37	8658	611.450	TTX 8658AP (8658)	8658	
37	8659	611.475	TTX 8659AP (8659)	8659	
37	8660	611.500	TTX 8660AP (8660)	8660	
37	8661	611.525	TTX 8661AP (8661)	8661	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
37	8662	611.550	TTX 8662AP (8662)	8662	
37	8663	611.575	TTX 8663AP (8663)	8663	
37	8664	611.600	TTX 8664AP (8664)	8664	
37	8665	611.625	TTX 8665AP (8665)	8665	
37	8666	611.650	TTX 8666AP (8666)	8666	
37	8667	611.675	TTX 8667AP (8667)	8667	
37	8668	611.700	TTX 8668AP (8668)	8668	
37	8669	611.725	TTX 8669AP (8669)	8669	
37	8670	611.750	TTX 8670AP (8670)	8670	
37	8671	611.775	TTX 8671AP (8671)	8671	
37	8672	611.800	TTX 8672AP (8672)	8672	
37	8673	611.825	TTX 8673AP (8673)	8673	
37	8674	611.850	TTX 8674AP (8674)	8674	
37	8675	611.875	TTX 8675AP (8675)	8675	
37	8676	611.900	TTX 8676AP (8676)	8676	
37	8677	611.925	TTX 8677AP (8677)	8677	
37	8678	611.950	TTX 8678AP (8678)	8678	
37	8679	611.975	TTX 8679AP (8679)	8679	
37	8680	612.000	TTX 8680AP (8680)	8680	
37	8681	612.025	TTX 8681AP (8681)	8681	
37	8682	612.050	TTX 8682AP (8682)	8682	
37	8683	612.075	TTX 8683AP (8683)	8683	
37	8684	612.100	TTX 8684AP (8684)	8684	
37	8685	612.125	TTX 8685AP (8685)	8685	
37	8686	612.150	TTX 8686AP (8686)	8686	
37	8687	612.175	TTX 8687AP (8687)	8687	
37	8688	612.200	TTX 8688AP (8688)	8688	
37	8689	612.225	TTX 8689AP (8689)	8689	
37	8690	612.250	TTX 8690AP (8690)	8690	
37	8691	612.275	TTX 8691AP (8691)	8691	
37	8692	612.300	TTX 8692AP (8692)	8692	
37	8693	612.325	TTX 8693AP (8693)	8693	
37	8694	612.350	TTX 8694AP (8694)	8694	
37	8695	612.375	TTX 8695AP (8695)	8695	
37	8696	612.400	TTX 8696AP (8696)	8696	
37	8697	612.425	TTX 8697AP (8697)	8697	
37	8698	612.450	TTX 8698AP (8698)	8698	
37	8699	612.475	TTX 8699AP (8699)	8699	
37	8700	612.500	TTX 8700AP (8700)	8700	
37	8701	612.525	TTX 8701AP (8701)	8701	
37	8702	612.550	TTX 8702AP (8702)	8702	
37	8703	612.575	TTX 8703AP (8703)	8703	
37	8704	612.600	TTX 8704AP (8704)	8704	
37	8705	612.625	TTX 8705AP (8705)	8705	
37	8706	612.650	TTX 8706AP (8706)	8706	
37	8707	612.675	TTX 8707AP (8707)	8707	
37	8708	612.700	TTX 8708AP (8708)	8708	
37	8709	612.725	TTX 8709AP (8709)	8709	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
37	8710	612.750	TTX 8710AP (8710)	8710	
37	8711	612.775	TTX 8711AP (8711)	8711	
37	8712	612.800	TTX 8712AP (8712)	8712	
37	8713	612.825	TTX 8713AP (8713)	8713	
37	8714	612.850	TTX 8714AP (8714)	8714	
37	8715	612.875	TTX 8715AP (8715)	8715	
37	8716	612.900	TTX 8716AP (8716)	8716	
37	8717	612.925	TTX 8717AP (8717)	8717	
37	8718	612.950	TTX 8718AP (8718)	8718	
37	8719	612.975	TTX 8719AP (8719)	8719	
37	8720	613.000	TTX 8720AP (8720)	8720	
37	8721	613.025	TTX 8721AP (8721)	8721	
37	8722	613.050	TTX 8722AP (8722)	8722	
37	8723	613.075	TTX 8723AP (8723)	8723	
37	8724	613.100	TTX 8724AP (8724)	8724	
37	8725	613.125	TTX 8725AP (8725)	8725	
37	8726	613.150	TTX 8726AP (8726)	8726	
37	8727	613.175	TTX 8727AP (8727)	8727	
37	8728	613.200	TTX 8728AP (8728)	8728	
37	8729	613.225	TTX 8729AP (8729)	8729	
37	8730	613.250	TTX 8730AP (8730)	8730	
37	8731	613.275	TTX 8731AP (8731)	8731	
37	8732	613.300	TTX 8732AP (8732)	8732	
37	8733	613.325	TTX 8733AP (8733)	8733	
37	8734	613.350	TTX 8734AP (8734)	8734	
37	8735	613.375	TTX 8735AP (8735)	8735	
37	8736	613.400	TTX 8736AP (8736)	8736	
37	8737	613.425	TTX 8737AP (8737)	8737	
37	8738	613.450	TTX 8738AP (8738)	8738	
37	8739	613.475	TTX 8739AP (8739)	8739	
37	8740	613.500	TTX 8740AP (8740)	8740	
37	8741	613.525	TTX 8741AP (8741)	8741	
37	8742	613.550	TTX 8742AP (8742)	8742	
37	8743	613.575	TTX 8743AP (8743)	8743	
37	8744	613.600	TTX 8744AP (8744)	8744	
37	8745	613.625	TTX 8745AP (8745)	8745	
37	8746	613.650	TTX 8746AP (8746)	8746	
37	8747	613.675	TTX 8747AP (8747)	8747	
37	8748	613.700	TTX 8748AP (8748)	8748	
37	8749	613.725	TTX 8749AP (8749)	8749	
37	8750	613.750	TTX 8750AP (8750)	8750	
37	8751	613.775	TTX 8751AP (8751)	8751	
37	8752	613.800	TTX 8752AP (8752)	8752	
37	8753	613.825	TTX 8753AP (8753)	8753	
37	8754	613.850	TTX 8754AP (8754)	8754	
37	8755	613.875	TTX 8755AP (8755)	8755	
37	8756	613.900	TTX 8756AP (8756)	8756	
37	8757	613.925	TTX 8757AP (8757)	8757	

TV Ch.	TTX ID	Freq (MHz)	Xmtr Label	(prog. box)	Note
37	8758	613.950	TTX 8758AP (8758)	8758	
37	8759	613.975	TTX 8759AP (8759)	8759	
…					

For your notes

ApexPro (Type B devices) TTX Frequency Chart

Channel = Japanese channel number; zone = Japanese Zone (1 through 9 for Type B devices)
TTX ID = Transmitter identifier entered into CIC; Xmtr Label = text on label applied to ApexPro transmitter
TTX # = Transmitter identifier used with the ApexPro Programming Device to configure the ApexPro transmitter
NOTE: Zone numbers with asterisks (*) are secondary zones.

Freq (MHz)	Channel (CH)	Zone	TTX ID	Xmtr Label	TTX # (prog. box)	Note
…						
424.500	2002	1	52202	CH2002AP (52202)	1180	
424.525	2004	2	52204	CH2004AP (52204)	1181	
424.550	2006	3	52206	CH2006AP (52206)	1182	
424.575	2008	4	52208	CH2008AP (52208)	1183	
…						
424.625	2012	6	52212	CH2012AP (52212)	1185	
424.650	2014	1	52214	CH2014AP (52214)	1186	
424.675	2016	2	52216	CH2016AP (52216)	1187	
424.700	2018	3	52218	CH2018AP (52218)	1188	
424.725	2020	4	52220	CH2020AP (52220)	1189	
424.750	2022	1	52222	CH2022AP (52222)	1190	
424.775	2024	2	52224	CH2024AP (52224)	1191	
424.800	2026	3	52226	CH2026AP (52226)	1192	
424.825	2028	4	52228	CH2028AP (52228)	1193	
424.850	2030	5	52230	CH2030AP (52230)	1194	
…						
424.900	2034	7	52234	CH2034AP (52234)	1196	
424.925	2036	8	52236	CH2036AP (52236)	1197	
424.950	2038	5	52238	CH2038AP (52238)	1198	
424.975	2040	6	52240	CH2040AP (52240)	1199	
425.000	2042	7	52242	CH2042AP (52242)	1200	
425.025	2044	8	52244	CH2044AP (52244)	1201	
…						
425.075	2048	1*, 5	52248	CH2048AP (52248)	1203	
425.100	2050	2, 6*	52250	CH2050AP (52250)	1204	
425.125	2052	3, 7*	52252	CH2052AP (52252)	1205	
425.150	2054	1, 4*, 8*	52254	CH2054AP (52254)	1206	
425.175	2056	2	52256	CH2056AP (52256)	1207	
425.200	2058	3	52258	CH2058AP (52258)	1208	
425.225	2060	4, 5*	52260	CH2060AP (52260)	1209	
425.250	2062	6	52262	CH2062AP (52262)	1210	
425.275	2064	7	52264	CH2064AP (52264)	1211	
425.300	2066	8	52266	CH2066AP (52266)	1212	
…						
425.350	2070	1	52270	CH2070AP (52270)	1214	
425.375	2072	2	52272	CH2072AP (52272)	1215	
425.400	2074	3, 5*	52274	CH2074AP (52274)	1216	
425.425	2076	4, 6*	52276	CH2076AP (52276)	1217	
425.450	2078	7	52278	CH2078AP (52278)	1218	
425.475	2080	8	52280	CH2080AP (52280)	1219	
…						
425.525	2084	1	52284	CH2084AP (52284)	1221	
425.550	2086	2	52286	CH2086AP (52286)	1222	
425.575	2088	3	52288	CH2088AP (52288)	1223	
425.600	2090	4	52290	CH2090AP (52290)	1224	
…						

Freq (MHz)	Channel (CH)	Zone	TTX ID	Xmtr Label	TTX # (prog. box)	Note
425.650	2094	5	52294	CH2094AP (52294)	1226	
425.675	2096	6	52296	CH2096AP (52296)	1227	
425.700	2098	5, 7*	52298	CH2098AP (52298)	1228	
425.725	2100	6, 8*	52300	CH2100AP (52300)	1229	
425.750	2102	7	52302	CH2102AP (52302)	1230	
425.775	2104	8	52304	CH2104AP (52304)	1231	
…						
425.825	2108	1	52308	CH2108AP (52308)	1233	
425.850	2110	2	52310	CH2110AP (52310)	1234	
425.875	2112	1, 3*	52312	CH2112AP (52312)	1235	
425.900	2114	2*, 4	52314	CH2114AP (52314)	1236	
425.925	2116	3	52316	CH2116AP (52316)	1237	
425.950	2118	4	52318	CH2118AP (52318)	1238	
…						
440.575	4002	1	54202	CH4002AP (54202)	1823	
440.600	4004	2, 7*	54204	CH4004AP (54204)	1824	
440.625	4006	3, 6*	54206	CH4006AP (54206)	1825	
440.650	4008	5*, 7*, 8	54208	CH4008AP (54208)	1826	
440.675	4010	1*, 4*, 6, 9*	54210	CH4010AP (54210)	1827	
440.700	4012	2*, 5	54212	CH4012AP (54212)	1828	
440.725	4014	3*, 4	54214	CH4014AP (54214)	1829	
440.750	4016	8	54216	CH4016AP (54216)	1830	
440.775	4018	9	54218	CH4018AP (54218)	1831	
440.800	4020	1	54220	CH4020AP (54220)	1832	
440.825	4022	2	54222	CH4022AP (54222)	1833	
440.850	4024	3	54224	CH4024AP (54224)	1834	
440.875	4026	8	54226	CH4026AP (54226)	1835	
440.900	4028	7, 9*	54228	CH4028AP (54228)	1836	
440.925	4030	6	54230	CH4030AP (54230)	1837	
440.950	4032	1*, 5	54232	CH4032AP (54232)	1838	
440.975	4034	2*, 4	54234	CH4034AP (54234)	1839	
441.000	4036	3	54236	CH4036AP (54236)	1840	
441.025	4038	8	54238	CH4038AP (54238)	1841	
441.050	4040	9	54240	CH4040AP (54240)	1842	
441.075	4042	7	54242	CH4042AP (54242)	1843	
441.100	4044	6	54244	CH4044AP (54244)	1844	
441.125	4046	1, 5*	54246	CH4046AP (54246)	1845	
441.150	4048	2, 4*	54248	CH4048AP (54248)	1846	
441.175	4050	3	54250	CH4050AP (54250)	1847	
441.200	4052	8	54252	CH4052AP (54252)	1848	
441.225	4054	7, 9*	54254	CH4054AP (54254)	1849	
441.250	4056	6	54256	CH4056AP (54256)	1850	
441.275	4058	5	54258	CH4058AP (54258)	1851	
441.300	4060	4	54260	CH4060AP (54260)	1852	
…						
…						
441.375	4066	1	54266	CH4066AP (54266)	1855	
441.400	4068	2	54268	CH4068AP (54268)	1856	

Freq (MHz)	Channel (CH)	Zone	TTX ID	Xmtr Label	TTX # (prog. box)	Note
441.425	4070	1*, 3*, 4	54270	CH4070AP (54270)	1857	
441.450	4072	2*, 7, 8*	54272	CH4072AP (54272)	1858	
441.475	4074	3*, 6*, 9	54274	CH4074AP (54274)	1859	
441.500	4076	5, 8*	54276	CH4076AP (54276)	1860	
441.525	4078	4*, 9	54278	CH4078AP (54278)	1861	
…						
444.525	5002	1	55202	CH5002AP (55202)	1981	
444.550	5004	2*, 7*	55204	CH5004AP (55204)	1982	
444.575	5006	3, 6*	55206	CH5006AP (55206)	1983	
444.600	5008	5*, 7*, 8	55208	CH5008AP (55208)	1984	
444.625	5010	1*, 4*, 6, 9*	55210	CH5010AP (55210)	1985	
444.650	5012	2*, 5	55212	CH5012AP (55212)	1986	
444.675	5014	3*, 4	55214	CH5014AP (55214)	1987	
444.700	5016	8	55216	CH5016AP (55216)	1988	
444.725	5018	9	55218	CH5018AP (55218)	1989	
444.750	5020	1	55220	CH5020AP (55220)	1990	
444.775	5022	2	55222	CH5022AP (55222)	1991	
444.800	5024	3	55224	CH5024AP (55224)	1992	
444.825	5026	8	55226	CH5026AP (55226)	1993	
444.850	5028	7, 9*	55228	CH5028AP (55228)	1994	
444.875	5030	6	55230	CH5030AP (55230)	1995	
444.900	5032	1*, 5	55232	CH5032AP (55232)	1996	
444.925	5034	2*, 4	55234	CH5034AP (55234)	1997	
444.950	5036	3	55236	CH5036AP (55236)	1998	
444.975	5038	8	55238	CH5038AP (55238)	1999	
445.000	5040	9	55240	CH5040AP (55240)	2000	
445.025	5042	7	55242	CH5042AP (55242)	2001	
445.050	5044	6	55244	CH5044AP (55244)	2002	
445.075	5046	1, 5*	55246	CH5046AP (55246)	2003	
445.100	5048	2, 4*	55248	CH5048AP (55248)	2004	
445.125	5050	3	55250	CH5050AP (55250)	2005	
445.150	5052	8	55252	CH5052AP (55252)	2006	
445.175	5054	7, 9*	55254	CH5054AP (55254)	2007	
445.200	5056	6	55256	CH5056AP (55256)	2008	
445.225	5058	5	55258	CH5058AP (55258)	2009	
445.250	5060	4	55260	CH5060AP (55260)	2010	
…						
…						
445.325	5066	1	55266	CH5066AP (55266)	2013	
445.350	5068	2	55268	CH5068AP (55268)	2014	
445.375	5070	1*, 3*, 4	55270	CH5070AP (55270)	2015	
445.400	5072	2*, 7, 8*	55272	CH5072AP (55272)	2016	
445.425	5074	3*, 6*, 9	55274	CH5074AP (55274)	2017	
445.450	5076	5, 8*	55276	CH5076AP (55276)	2018	
445.475	5078	4*, 9	55278	CH5078AP (55278)	2019	

For your notes

PT Series (Type A devices) Frequency to TTX Conversion

Channel = Japanese channel number; TTX ID = Transmitter identifier entered into CIC
Xmtr Label = text on label applied to PT Series transmitter

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
420.0500	1001	51001	CH1001PT (51001)	
420.0625	1002	51002	CH1002PT (51002)	
420.0750	1003	51003	CH1003PT (51003)	
420.0875	1004	51004	CH1004PT (51004)	
420.1000	1005	51005	CH1005PT (51005)	
420.1125	1006	51006	CH1006PT (51006)	
420.1250	1007	51007	CH1007PT (51007)	
420.1375	1008	51008	CH1008PT (51008)	
420.1500	1009	51009	CH1009PT (51009)	
420.1625	1010	51010	CH1010PT (51010)	
…				
…				
…				
420.2125	1014	51014	CH1014PT (51014)	
420.2250	1015	51015	CH1015PT (51015)	
420.2375	1016	51016	CH1016PT (51016)	
420.2500	1017	51017	CH1017PT (51017)	
420.2625	1018	51018	CH1018PT (51018)	
420.2750	1019	51019	CH1019PT (51019)	
420.2875	1020	51020	CH1020PT (51020)	
420.3000	1021	51021	CH1021PT (51021)	
420.3125	1022	51022	CH1022PT (51022)	
420.3250	1023	51023	CH1023PT (51023)	
420.3375	1024	51024	CH1024PT (51024)	
420.3500	1025	51025	CH1025PT (51025)	
420.3625	1026	51026	CH1026PT (51026)	
420.3750	1027	51027	CH1027PT (51027)	
420.3875	1028	51028	CH1028PT (51028)	
420.4000	1029	51029	CH1029PT (51029)	
420.4125	1030	51030	CH1030PT (51030)	
420.4250	1031	51031	CH1031PT (51031)	
420.4375	1032	51032	CH1032PT (51032)	
420.4500	1033	51033	CH1033PT (51033)	
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420.4875	1036	51036	CH1036PT (51036)	
420.5000	1037	51037	CH1037PT (51037)	
420.5125	1038	51038	CH1038PT (51038)	
420.5250	1039	51039	CH1039PT (51039)	
420.5375	1040	51040	CH1040PT (51040)	
420.5500	1041	51041	CH1041PT (51041)	
420.5625	1042	51042	CH1042PT (51042)	
420.5750	1043	51043	CH1043PT (51043)	
420.5875	1044	51044	CH1044PT (51044)	
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Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
420.6375	1048	51048	CH1048PT (51048)	
420.6500	1049	51049	CH1049PT (51049)	
420.6625	1050	51050	CH1050PT (51050)	
420.6750	1051	51051	CH1051PT (51051)	
420.6875	1052	51052	CH1052PT (51052)	
420.7000	1053	51053	CH1053PT (51053)	
420.7125	1054	51054	CH1054PT (51054)	
420.7250	1055	51055	CH1055PT (51055)	
420.7375	1056	51056	CH1056PT (51056)	
420.7500	1057	51057	CH1057PT (51057)	
420.7625	1058	51058	CH1058PT (51058)	
420.7750	1059	51059	CH1059PT (51059)	
420.7875	1060	51060	CH1060PT (51060)	
420.8000	1061	51061	CH1061PT (51061)	
420.8125	1062	51062	CH1062PT (51062)	
420.8250	1063	51063	CH1063PT (51063)	
420.8375	1064	51064	CH1064PT (51064)	
420.8500	1065	51065	CH1065PT (51065)	
420.8625	1066	51066	CH1066PT (51066)	
420.8750	1067	51067	CH1067PT (51067)	
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420.9250	1071	51071	CH1071PT (51071)	
420.9375	1072	51072	CH1072PT (51072)	
420.9500	1073	51073	CH1073PT (51073)	
420.9625	1074	51074	CH1074PT (51074)	
420.9750	1075	51075	CH1075PT (51075)	
420.9875	1076	51076	CH1076PT (51076)	
421.0000	1077	51077	CH1077PT (51077)	
421.0125	1078	51078	CH1078PT (51078)	
421.0250	1079	51079	CH1079PT (51079)	
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424.4875	2001	52001	CH2001PT (52001)	
424.5000	2002	52002	CH2002PT (52002)	
424.5125	2003	52003	CH2003PT (52003)	
424.5250	2004	52004	CH2004PT (52004)	
424.5375	2005	52005	CH2005PT (52005)	
424.5500	2006	52006	CH2006PT (52006)	
424.5625	2007	52007	CH2007PT (52007)	
424.5750	2008	52008	CH2008PT (52008)	
424.5875	2009	52009	CH2009PT (52009)	
424.6000	2010	52010	CH2010PT (52010)	
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424.6250	2012	52012	CH2012PT (52012)	
424.6375	2013	52013	CH2013PT (52013)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
424.6500	2014	52014	CH2014PT (52014)	
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424.6750	2016	52016	CH2016PT (52016)	
424.6875	2017	52017	CH2017PT (52017)	
424.7000	2018	52018	CH2018PT (52018)	
424.7125	2019	52019	CH2019PT (52019)	
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424.7500	2022	52022	CH2022PT (52022)	
424.7625	2023	52023	CH2023PT (52023)	
424.7750	2024	52024	CH2024PT (52024)	
424.7875	2025	52025	CH2025PT (52025)	
424.8000	2026	52026	CH2026PT (52026)	
424.8125	2027	52027	CH2027PT (52027)	
424.8250	2028	52028	CH2028PT (52028)	
424.8375	2029	52029	CH2029PT (52029)	
424.8500	2030	52030	CH2030PT (52030)	
424.8625	2031	52031	CH2031PT (52031)	
424.8750	2032	52032	CH2032PT (52032)	
424.8875	2033	52033	CH2033PT (52033)	
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424.9125	2035	52035	CH2035PT (52035)	
424.9250	2036	52036	CH2036PT (52036)	
424.9375	2037	52037	CH2037PT (52037)	
424.9500	2038	52038	CH2038PT (52038)	
424.9625	2039	52039	CH2039PT (52039)	
424.9750	2040	52040	CH2040PT (52040)	
424.9875	2041	52041	CH2041PT (52041)	
425.0000	2042	52042	CH2042PT (52042)	
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425.0375	2045	52045	CH2045PT (52045)	
425.0500	2046	52046	CH2046PT (52046)	
425.0625	2047	52047	CH2047PT (52047)	
425.0750	2048	52048	CH2048PT (52048)	
425.0875	2049	52049	CH2049PT (52049)	
425.1000	2050	52050	CH2050PT (52050)	
425.1125	2051	52051	CH2051PT (52051)	
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425.1500	2054	52054	CH2054PT (52054)	
425.1625	2055	52055	CH2055PT (52055)	
425.1750	2056	52056	CH2056PT (52056)	
425.1875	2057	52057	CH2057PT (52057)	
425.2000	2058	52058	CH2058PT (52058)	
425.2125	2059	52059	CH2059PT (52059)	
425.2250	2060	52060	CH2060PT (52060)	
425.2375	2061	52061	CH2061PT (52061)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
425.2500	2062	52062	CH2062PT (52062)	
425.2625	2063	52063	CH2063PT (52063)	
425.2750	2064	52064	CH2064PT (52064)	
425.2875	2065	52065	CH2065PT (52065)	
425.3000	2066	52066	CH2066PT (52066)	
425.3125	2067	52067	CH2067PT (52067)	
425.3250	2068	52068	CH2068PT (52068)	
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425.3625	2071	52071	CH2071PT (52071)	
425.3750	2072	52072	CH2072PT (52072)	
425.3875	2073	52073	CH2073PT (52073)	
425.4000	2074	52074	CH2074PT (52074)	
425.4125	2075	52075	CH2075PT (52075)	
425.4250	2076	52076	CH2076PT (52076)	
425.4375	2077	52077	CH2077PT (52077)	
425.4500	2078	52078	CH2078PT (52078)	
425.4625	2079	52079	CH2079PT (52079)	
425.4750	2080	52080	CH2080PT (52080)	
425.4875	2081	52081	CH2081PT (52081)	
425.5000	2082	52082	CH2082PT (52082)	
425.5125	2083	52083	CH2083PT (52083)	
425.5250	2084	52084	CH2084PT (52084)	
425.5375	2085	52085	CH2085PT (52085)	
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425.6125	2091	52091	CH2091PT (52091)	
425.6250	2092	52092	CH2092PT (52092)	
425.6375	2093	52093	CH2093PT (52093)	
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425.6625	2095	52095	CH2095PT (52095)	
425.6750	2096	52096	CH2096PT (52096)	
425.6875	2097	52097	CH2097PT (52097)	
425.7000	2098	52098	CH2098PT (52098)	
425.7125	2099	52099	CH2099PT (52099)	
425.7250	2100	52100	CH2100PT (52100)	
425.7375	2101	52101	CH2101PT (52101)	
425.7500	2102	52102	CH2102PT (52102)	
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425.8250	2108	52108	CH2108PT (52108)	
425.8375	2109	52109	CH2109PT (52109)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
425.8500	2110	52110	CH2110PT (52110)	
425.8625	2111	52111	CH2111PT (52111)	
425.8750	2112	52112	CH2112PT (52112)	
425.8875	2113	52113	CH2113PT (52113)	
425.9000	2114	52114	CH2114PT (52114)	
425.9125	2115	52115	CH2115PT (52115)	
425.9250	2116	52116	CH2116PT (52116)	
425.9375	2117	52117	CH2117PT (52117)	
425.9500	2118	52118	CH2118PT (52118)	
425.9625	2119	52119	CH2119PT (52119)	
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429.2500	3001	53001	CH3001PT (53001)	
429.2625	3002	53002	CH3002PT (53002)	
429.2750	3003	53003	CH3003PT (53003)	
429.2875	3004	53004	CH3004PT (53004)	
429.3000	3005	53005	CH3005PT (53005)	
429.3125	3006	53006	CH3006PT (53006)	
429.3250	3007	53007	CH3007PT (53007)	
429.3375	3008	53008	CH3008PT (53008)	
429.3500	3009	53009	CH3009PT (53009)	
429.3625	3010	53010	CH3010PT (53010)	
429.3750	3011	53011	CH3011PT (53011)	
429.3875	3012	53012	CH3012PT (53012)	
429.4000	3013	53013	CH3013PT (53013)	
429.4125	3014	53014	CH3014PT (53014)	
429.4250	3015	53015	CH3015PT (53015)	
429.4375	3016	53016	CH3016PT (53016)	
429.4500	3017	53017	CH3017PT (53017)	
429.4625	3018	53018	CH3018PT (53018)	
429.4750	3019	53019	CH3019PT (53019)	
429.4875	3020	53020	CH3020PT (53020)	
429.5000	3021	53021	CH3021PT (53021)	
429.5125	3022	53022	CH3022PT (53022)	
429.5250	3023	53023	CH3023PT (53023)	
429.5375	3024	53024	CH3024PT (53024)	
429.5500	3025	53025	CH3025PT (53025)	
429.5625	3026	53026	CH3026PT (53026)	
429.5750	3027	53027	CH3027PT (53027)	
429.5875	3028	53028	CH3028PT (53028)	
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429.6250	3031	53031	CH3031PT (53031)	
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429.6500	3033	53033	CH3033PT (53033)	
429.6625	3034	53034	CH3034PT (53034)	
429.6750	3035	53035	CH3035PT (53035)	
429.6875	3036	53036	CH3036PT (53036)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
429.7000	3037	53037	CH3037PT (53037)	
429.7125	3038	53038	CH3038PT (53038)	
429.7250	3039	53039	CH3039PT (53039)	
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440.5625	4001	54001	CH4001PT (54001)	
440.5750	4002	54002	CH4002PT (54002)	
440.5875	4003	54003	CH4003PT (54003)	
440.6000	4004	54004	CH4004PT (54004)	
440.6125	4005	54005	CH4005PT (54005)	
440.6250	4006	54006	CH4006PT (54006)	
440.6375	4007	54007	CH4007PT (54007)	
440.6500	4008	54008	CH4008PT (54008)	
440.6625	4009	54009	CH4009PT (54009)	
440.6750	4010	54010	CH4010PT (54010)	
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440.7250	4014	54014	CH4014PT (54014)	
440.7375	4015	54015	CH4015PT (54015)	
440.7500	4016	54016	CH4016PT (54016)	
440.7625	4017	54017	CH4017PT (54017)	
440.7750	4018	54018	CH4018PT (54018)	
440.7875	4019	54019	CH4019PT (54019)	
440.8000	4020	54020	CH4020PT (54020)	
440.8125	4021	54021	CH4021PT (54021)	
440.8250	4022	54022	CH4022PT (54022)	
440.8375	4023	54023	CH4023PT (54023)	
440.8500	4024	54024	CH4024PT (54024)	
440.8625	4025	54025	CH4025PT (54025)	
440.8750	4026	54026	CH4026PT (54026)	
440.8875	4027	54027	CH4027PT (54027)	
440.9000	4028	54028	CH4028PT (54028)	
440.9125	4029	54029	CH4029PT (54029)	
440.9250	4030	54030	CH4030PT (54030)	
440.9375	4031	54031	CH4031PT (54031)	
440.9500	4032	54032	CH4032PT (54032)	
440.9625	4033	54033	CH4033PT (54033)	
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441.0000	4036	54036	CH4036PT (54036)	
441.0125	4037	54037	CH4037PT (54037)	
441.0250	4038	54038	CH4038PT (54038)	
441.0375	4039	54039	CH4039PT (54039)	
441.0500	4040	54040	CH4040PT (54040)	
441.0625	4041	54041	CH4041PT (54041)	
441.0750	4042	54042	CH4042PT (54042)	
441.0875	4043	54043	CH4043PT (54043)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
441.1000	4044	54044	CH4044PT (54044)	
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441.1500	4048	54048	CH4048PT (54048)	
441.1625	4049	54049	CH4049PT (54049)	
441.1750	4050	54050	CH4050PT (54050)	
441.1875	4051	54051	CH4051PT (54051)	
…				
441.2125	4053	54053	CH4053PT (54053)	
441.2250	4054	54054	CH4054PT (54054)	
441.2375	4055	54055	CH4055PT (54055)	
441.2500	4056	54056	CH4056PT (54056)	
441.2625	4057	54057	CH4057PT (54057)	
441.2750	4058	54058	CH4058PT (54058)	
441.2875	4059	54059	CH4059PT (54059)	
441.3000	4060	54060	CH4060PT (54060)	
441.3125	4061	54061	CH4061PT (54061)	
441.3250	4062	54062	CH4062PT (54062)	
441.3375	4063	54063	CH4063PT (54063)	
441.3500	4064	54064	CH4064PT (54064)	
441.3625	4065	54065	CH4065PT (54065)	
441.3750	4066	54066	CH4066PT (54066)	
441.3875	4067	54067	CH4067PT (54067)	
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441.4375	4071	54071	CH4071PT (54071)	
441.4500	4072	54072	CH4072PT (54072)	
441.4625	4073	54073	CH4073PT (54073)	
441.4750	4074	54074	CH4074PT (54074)	
441.4875	4075	54075	CH4075PT (54075)	
441.5000	4076	54076	CH4076PT (54076)	
441.5125	4077	54077	CH4077PT (54077)	
441.5250	4078	54078	CH4078PT (54078)	
441.5375	4079	54079	CH4079PT (54079)	
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445.5125	5001	55001	CH5001PT (55001)	
445.5250	5002	55002	CH5002PT (55002)	
445.5375	5003	55003	CH5003PT (55003)	
445.5500	5004	55004	CH5004PT (55004)	
445.5625	5005	55005	CH5005PT (55005)	
445.5750	5006	55006	CH5006PT (55006)	
445.5875	5007	55007	CH5007PT (55007)	
445.6000	5008	55008	CH5008PT (55008)	
445.6125	5009	55009	CH5009PT (55009)	
445.6250	5010	55010	CH5010PT (55010)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
…				
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445.6750	5014	55014	CH5014PT (55014)	
445.6875	5015	55015	CH5015PT (55015)	
445.7000	5016	55016	CH5016PT (55016)	
445.7125	5017	55017	CH5017PT (55017)	
445.7250	5018	55018	CH5018PT (55018)	
445.7375	5019	55019	CH5019PT (55019)	
445.7500	5020	55020	CH5020PT (55020)	
445.7625	5021	55021	CH5021PT (55021)	
445.7750	5022	55022	CH5022PT (55022)	
445.7875	5023	55023	CH5023PT (55023)	
445.8000	5024	55024	CH5024PT (55024)	
445.8125	5025	55025	CH5025PT (55025)	
445.8250	5026	55026	CH5026PT (55026)	
445.8375	5027	55027	CH5027PT (55027)	
445.8500	5028	55028	CH5028PT (55028)	
445.8625	5029	55029	CH5029PT (55029)	
445.8750	5030	55030	CH5030PT (55030)	
445.8875	5031	55031	CH5031PT (55031)	
445.9000	5032	55032	CH5032PT (55032)	
445.9125	5033	55033	CH5033PT (55033)	
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445.9500	5036	55036	CH5036PT (55036)	
445.9625	5037	55037	CH5037PT (55037)	
445.9750	5038	55038	CH5038PT (55038)	
445.9875	5039	55039	CH5039PT (55039)	
446.0000	5040	55040	CH5040PT (55040)	
446.0125	5041	55041	CH5041PT (55041)	
446.0250	5042	55042	CH5042PT (55042)	
446.0375	5043	55043	CH5043PT (55043)	
446.0500	5044	55044	CH5044PT (55044)	
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446.1000	5048	55048	CH5048PT (55048)	
446.1125	5049	55049	CH5049PT (55049)	
446.1250	5050	55050	CH5050PT (55050)	
446.1375	5051	55051	CH5051PT (55051)	
…				
446.1625	5053	55053	CH5053PT (55053)	
446.1750	5054	55054	CH5054PT (55054)	
446.1875	5055	55055	CH5055PT (55055)	
446.2000	5056	55056	CH5056PT (55056)	
446.2125	5057	55057	CH5057PT (55057)	
446.2250	5058	55058	CH5058PT (55058)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
446.2375	5059	55059	CH5059PT (55059)	
446.2500	5060	55060	CH5060PT (55060)	
446.2625	5061	55061	CH5061PT (55061)	
446.2750	5062	55062	CH5062PT (55062)	
446.2875	5063	55063	CH5063PT (55063)	
446.3000	5064	55064	CH5064PT (55064)	
446.3125	5065	55065	CH5065PT (55065)	
446.3250	5066	55066	CH5066PT (55066)	
446.3375	5067	55067	CH5067PT (55067)	
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446.3875	5071	55071	CH5071PT (55071)	
446.4000	5072	55072	CH5072PT (55072)	
446.4125	5073	55073	CH5073PT (55073)	
446.4250	5074	55074	CH5074PT (55074)	
446.4375	5075	55075	CH5075PT (55075)	
446.4500	5076	55076	CH5076PT (55076)	
446.4625	5077	55077	CH5077PT (55077)	
446.4750	5078	55078	CH5078PT (55078)	
446.4875	5079	55079	CH5079PT (55079)	
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448.6750	6001	56001	CH6001PT (56001)	
448.6875	6002	56002	CH6002PT (56002)	
448.7000	6003	56003	CH6003PT (56003)	
448.7125	6004	56004	CH6004PT (56004)	
448.7250	6005	56005	CH6005PT (56005)	
448.7375	6006	56006	CH6006PT (56006)	
448.7500	6007	56007	CH6007PT (56007)	
448.7625	6008	56008	CH6008PT (56008)	
448.7750	6009	56009	CH6009PT (56009)	
448.7875	6010	56010	CH6010PT (56010)	
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448.8375	6014	56014	CH6014PT (56014)	
448.8500	6015	56015	CH6015PT (56015)	
448.8625	6016	56016	CH6016PT (56016)	
448.8750	6017	56017	CH6017PT (56017)	
448.8875	6018	56018	CH6018PT (56018)	
448.9000	6019	56019	CH6019PT (56019)	
448.9125	6020	56020	CH6020PT (56020)	
448.9250	6021	56021	CH6021PT (56021)	
448.9375	6022	56022	CH6022PT (56022)	
448.9500	6023	56023	CH6023PT (56023)	
448.9625	6024	56024	CH6024PT (56024)	
448.9750	6025	56025	CH6025PT (56025)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
448.9875	6026	56026	CH6026PT (56026)	
449.0000	6027	56027	CH6027PT (56027)	
449.0125	6028	56028	CH6028PT (56028)	
449.0250	6029	56029	CH6029PT (56029)	
449.0375	6030	56030	CH6030PT (56030)	
449.0500	6031	56031	CH6031PT (56031)	
449.0625	6032	56032	CH6032PT (56032)	
449.0750	6033	56033	CH6033PT (56033)	
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449.1125	6036	56036	CH6036PT (56036)	
449.1250	6037	56037	CH6037PT (56037)	
449.1375	6038	56038	CH6038PT (56038)	
449.1500	6039	56039	CH6039PT (56039)	
449.1625	6040	56040	CH6040PT (56040)	
449.1750	6041	56041	CH6041PT (56041)	
449.1875	6042	56042	CH6042PT (56042)	
449.2000	6043	56043	CH6043PT (56043)	
449.2125	6044	56044	CH6044PT (56044)	
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…				
449.2625	6048	56048	CH6048PT (56048)	
449.2750	6049	56049	CH6049PT (56049)	
449.2875	6050	56050	CH6050PT (56050)	
449.3000	6051	56051	CH6051PT (56051)	
…				
449.3250	6053	56053	CH6053PT (56053)	
449.3375	6054	56054	CH6054PT (56054)	
449.3500	6055	56055	CH6055PT (56055)	
449.3625	6056	56056	CH6056PT (56056)	
449.3750	6057	56057	CH6057PT (56057)	
449.3875	6058	56058	CH6058PT (56058)	
449.4000	6059	56059	CH6059PT (56059)	
449.4125	6060	56060	CH6060PT (56060)	
449.4250	6061	56061	CH6061PT (56061)	
449.4375	6062	56062	CH6062PT (56062)	
449.4500	6063	56063	CH6063PT (56063)	
449.4625	6064	56064	CH6064PT (56064)	
449.4750	6065	56065	CH6065PT (56065)	
449.4875	6066	56066	CH6066PT (56066)	
449.5000	6067	56067	CH6067PT (56067)	
…				
…				
…				
449.5500	6071	56071	CH6071PT (56071)	
449.5625	6072	56072	CH6072PT (56072)	
449.5750	6073	56073	CH6073PT (56073)	

Freq (MHz)	Channel (CH)	TTX ID	Xmtr Label	Note
449.5875	6074	56074	CH6074PT (56074)	
449.6000	6075	56075	CH6075PT (56075)	
449.6125	6076	56076	CH6076PT (56076)	
449.6250	6077	56077	CH6077PT (56077)	
449.6375	6078	56078	CH6078PT (56078)	
449.6500	6079	56079	CH6079PT (56079)	
…				

4 Maintenance

For your notes

Disinfection

Disinfection of the transmitter assembly must be performed in accordance with the policies and procedures of your institution's infection control or biomedical staff.

NOTE

Inspect the transmitter and leadwires for damage before they are used on any new patients. This inspection is vital to maintain the integrity of the transmitter's environmental seals.

For intensive disinfection or sterilization of the transmitter:

- Aqueous disinfectants such as glutaraldehydes (Sporicidin, etc.), 2-part sodium chloride/lactic acid mixture (i.e., Exspor and other chlorine dioxide action types), and other cold rinses are acceptable. These solutions may shorten the transmitter's useful lifetime after repeated applications.
- Remove the batteries before cleaning the transmitter.
- Disconnect the leadwires from the transmitter.
- Always dilute the cleaning solutions according to the manufacturer's recommendations.
- Always wipe off the cleaning solutions with a clean, dry, lint-free cloth after cleaning.
- Never pour or spray water or any cleaning solution on the transmitter or permit fluids to seep behind connectors or into openings.
- DO NOT immerse the transmitter in any cleaning solution.
- DO NOT autoclave or steam clean the transmitter.
- Ethylene Oxide (ETO) is acceptable but may discolor and/or reduce the useful lifetime of the transmitter.

CAUTION

The decision to sterilize the transmitter must be made in accordance with each institution's requirements. Be aware that sterilization agents may have a detrimental effect upon the transmitter and its operation.

Equipment Maintenance Program

Recommended Maintenance Procedures

A regular equipment maintenance program helps prevent unnecessary equipment and power failures and also reduces possible health hazards. Perform the following procedures as a regular preventive maintenance schedule. Record the date and results on the Maintenance/Repair Log included at the end of this chapter.

- Inspect the unit according to "Visual Inspection" on page 5.
- Clean the unit according to "Cleaning" on page 8.
- Verify the unit is working properly according to "Checkout Procedure" on page 12.

Recommended Frequency

To help you establish a systematic maintenance routine, GE Medical Systems *Information Technologies* recommends that you perform all maintenance procedures presented in this chapter:

NOTE

Inspect the transmitter and leadwires for damage before they are used on any new patients. This inspection is vital to maintain the integrity of the transmitter's environmental seals.

- upon receipt of the unit,
- every twelve months thereafter,
- each time a circuit board is removed or replaced, and
- record the repair and maintenance history on the Repair Log found at the end of this chapter. Make copies of the log and use it during the preventive maintenance and checkout activities, then file for future reference.

WARNING

Failure to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazards. Unless you have an Equipment Maintenance Contract, GE Medical Systems *Information Technologies* does not in any manner assume the responsibility for performing the recommended maintenance procedures. The sole responsibility rests with the individual or institution using the equipment. GE Medical Systems *Information Technologies* service personnel may, at their discretion, follow the procedures provided in this manual as a guide during visits to the equipment site.

Visual Inspection

Inspect for Damage

The following steps check for obvious damage.

- Inspect the transmitter case for cracks or other damage. Do not use a transmitter that is damaged.
- Inspect the transmitter case for damage that may affect the environmental seals (such as the unit was dropped and the case seals opened as a result of the impact). Do not use a transmitter that has seals that have been compromised.
- Inspect the membrane switch for the GRAPH and VERIFY LEADS controls. If the membrane is cracked or damaged do not use the transmitter.
- Inspect the leadwire connections for corroded or bent connector pins. Do not use a transmitter with bad leadwire connectors.
- Inspect the leadwires for cracks or other damage. Replace leadwires that are cracked, damaged, or no longer flexible.
- Open battery compartment and inspect the battery contacts. Clean them if they are dirty or corroded.
- The battery compartment is not sealed and may be exposed to moisture. If there are any visible signs of moisture within the battery, return for service.
- Inspect the dust covers before each use to verify that they are securely attached.

If a transmitter or leadwires fail any of the above inspections, immediately service or replace it.

Verify Labels

NOTE

The transmitter must be running software version 2C or later to use this feature. Refer to the APEX and ApexPro Telemetry System Programming Device Service Instructions to verify transmitter software revision.

Follow these steps:

1. Verify that the TTX label is present and the data recorded on it is accurate for the transmitter. The programmed TTX number can be determined by pressing and holding both the **Verify Leads** and **Graph** control buttons when the transmitter is powered up (batteries inserted).
2. Release both buttons when the four LEDs illuminate. The RA LED flashes the same number assigned to the most significant TTX number. The second LED flashes the number assigned to the second most significant TTX number and so on with the third and the forth LEDs. A “0” in the transmitter number displays by flashing the corresponding LED 10 times. See example.

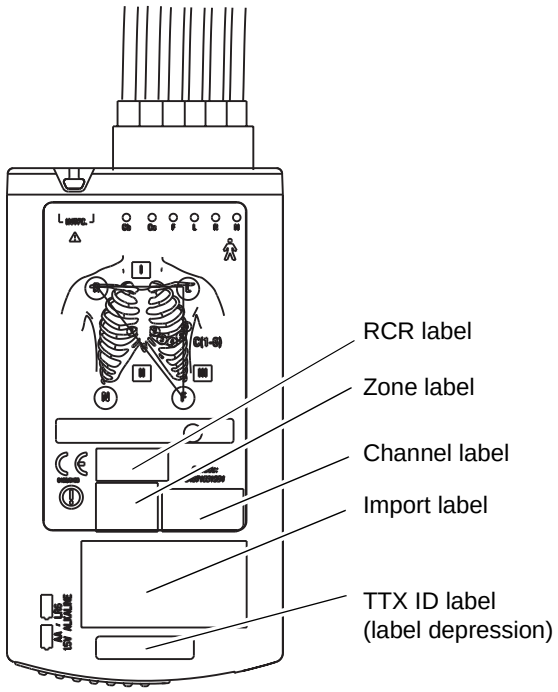
LEDs	RA O	LA O	LL O	VA O
TTX #	8	5	7	0
Transmitter Response	8–Flashes	5–Flashes	7–Flashes	10–Flashes.

NOTE

FOR JAPAN ONLY. The TTX flashed out by the transmitter is NOT the channel number. Use the charts "ApexPro (Type B devices) TTX Frequency Chart" on page 3-37 to match the TTX number with its corresponding channel number. See the programming kit instructions for more information.

CAUTION

Make sure the TTX numbers match. Failure to do so may result in the monitoring of the wrong patient.



3. Verify that the membrane switch label is securely attached to the case.

Verify Transmitter Appearance

Transmitters can have one of the following configurations. These configurations are indicated by the labels next to the interface connector ports at the top of the transmitter and by the color of the interface connector port dust covers. Use the following chart to ensure that the transmitter's appearance matches its enabled features.

Transmitter Feature Configuration	Start Up LED Sequence	Transmitter Appearance
Single Lead ECG INACTIVE interface connector ports	All LEDs, except **Change Battery** and **RA**, light on second flash.	**Single Lead** label. Blue interface connector port covers and label.
Single Lead ECG ACTIVE interface connector ports	All LEDs, except **RA** light on second flash.	**Single Lead** label. Gray interface connector port covers.
Multi-Lead ECG ACTIVE interface connector ports	All LEDs light on second flash.	No labels. Gray interface connector port covers.

Cleaning

General

WARNING
Remove the battery before cleaning or disinfecting its surface.

Clean the equipment on a regular basis. (Comply with the policies of your institution's infection control unit and/or biomed department.) The exterior surfaces of the equipment may be cleaned with a dampened, lint-free cloth. Use one of the following approved solutions:

- ammonia (diluted)
- Cidex
- mild soap (diluted)
- sodium hypochlorite bleach (diluted)

NOTE
Severe corrosion may occur to any metal parts that come in contact with bleach. Do not submerge patient cable ends or leadwire ends.

To avoid damage to the equipment, follow these rules:

CAUTION
Failure to follow these rules may melt, distort, or dull the finish of the case, blur lettering on the labels, or cause equipment failures.

- Always dilute the solutions according to the manufacturer's suggestions.
- Always wipe off all the cleaning solution with a dry cloth after cleaning.
- Never use a cleaning substance containing wax.
- Never pour or spray water or any cleaning solution on the equipment.
- Never permit fluids to run behind switches, into the connectors, or into any ventilation openings in the equipment.
- Never use these cleaning agents:
  - abrasive cleaners or solvents of any kind,
  - acetone,
  - ketone,
  - alcohol-based cleaning agents, or
  - Betadine

Transmitters

These cleaning instructions apply to the ApexPro transmitter, the Apex Oximeter, the Nonin Xpod oximeter, and the Accutracker DX blood pressure monitor.

CAUTION
Do not autoclave the transmitter.

For general cleaning, wiping with mild soap and water and wiping dry is recommended.

For more intensive disinfecting or sterilization:

- Aqueous disinfectants such as glutaraldehydes (Sporicidin, etc.), 2-part sodium chloride/lactic acid mixture (i.e., Exspor and other chlorine dioxide action types), and other cold cleaning agents are acceptable. These solutions may shorten the transmitter's useful lifetime after repeated applications.
- Ethylene Oxide (ETO) is acceptable but may discolor and/or reduce the useful lifetime of the transmitter.

CAUTION
The decision to sterilize must be made per your institution's requirements with an awareness of the effect on the integrity of the transmitter.

Do not submerse the transmitters.

Leadwires

CAUTION
Do not use acetone or ketone solvents for cleaning; do not use an autoclave or steam cleaner.

For general cleaning, wipe with a lint-free cloth dampened with mild soap and water. Drying off excess cleaning solution is recommended. Leadwires should hang freely when wiping. Leadwires can be cleaned with isopropyl alcohol wipes. For more intensive disinfecting or sterilization:

- Aqueous disinfectants such as glutaraldehydes (Sporicidin, etc.), 2-part sodium chloride/lactic acid mixture (i.e., Exspor and other chlorine dioxide action types), and other cold cleaning agents are acceptable. These solutions may shorten the leadwire's useful lifetime after repeated applications.
- Ethylene Oxide (ETO) is acceptable but may discolor and/or reduce the useful lifetime of the leadwire.

CAUTION
The decision to sterilize must be made per your institution's requirements with an awareness of the effect on the integrity of the leadwire.

Do not submerse telemetry leadwires.

Transmitter and Leadwire Storage

Transmitter Holder

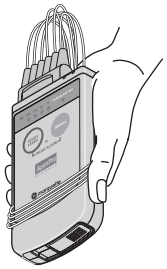
GE recommends storing the transmitter and leadwires in the optional transmitter holder (not pictured). This wall-mounted holder can store up to six ApexPro transmitters. The leadwires hang freely below the holder, minimizing the possibility of damage.

Storage Guidelines

If a transmitter holder is not available, follow these guidelines for storage.

Correct Storage

The proper way to store the transmitter is to wrap the leadwires around the transmitter, allowing the top of the leadwires to remain loose. Leadwires should NOT be stretched tightly during storage.



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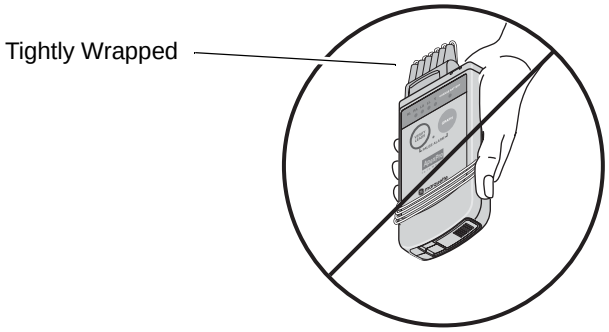
Incorrect Storage

Do NOT bend or stretch leadwires tightly before wrapping around the transmitter. Improper storage will cause damage and shorten the leadwires' useful lifetime.



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Checkout Procedure

This procedure describes a series of performance tests for the ApexPro Transmitter and optional Apex Oximeter and Nonin Xpod oximeter.

Required Test Equipment

The following equipment is required.

- ECG simulator
- New alkaline “AA” batteries and low-voltage batteries
- Digital multimeter
- RF service monitor or equivalent spectrum analyzer
- SpO_2 simulator, pn 408610-001 for optional Apex Oximeter and Nonin Xpod oximeter testing
- Nonin simulator cable adapter, pn 420970-001 for optional Apex Oximeter and Nonin Xpod oximeter testing

Transmitter Operational Tests

LED Displays

This test verifies LED operation.

1. Attach the leadwires to an ECG source.
2. Install batteries into the transmitter, then wait for the powerup selftests to be completed.
3. Press the VERIFY LEADS and GRAPH buttons simultaneously. The LEAD STATUS and CHANGE BATTERY LEDs flash twice to acknowledge the switch was pressed. Then the PAUSE ALARM LED starts flashing.

Powerup Selftests

This test verifies completion of the powerup selftests.

1. Remove any batteries in the transmitter.
2. Replace the batteries in the transmitter.

   The transmitter then performs the following tests:

   - memory (RAM and EEPROM)
   - frequency synthesizer
   - displays installed options through the LED start up sequence. Please refer to “Start Up” on page 2-6 to verify the features of your transmitter.

If the selftests are successful, the transmitter begins normal operation.

RF Power Shutdown

This test verifies that the transmitter reduces its output when an all-leads-fail condition lasts more than six seconds.

1. Connect the transmitter to an ECG source.
2. Install batteries in the transmitter.
3. At a Clinical Information Center, verify that the transmitter is sending the ECG source's signals properly.
4. Remove the leadwires from the ECG source.

After six seconds a NO TELEM signal displays for the transmitter being tested (at the Clinical Information Center).

This test could also be done using the RF monitor to measure the decrease in RF output under a LEADS FAIL condition.

Change Battery LED

This test verifies that the transmitter and the Clinical Information Center indicate a low battery condition if the transmitter battery voltage drops below 1.9V.

1. Remove batteries from transmitter.
2. Install low-voltage batteries.
3. Verify that the transmitter powers up successfully and performs the self-tests.

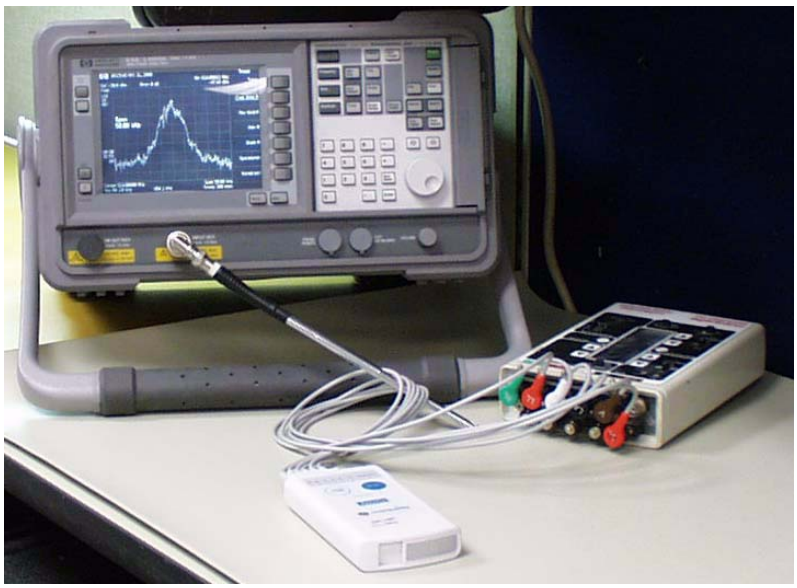
   The transmitter minimum start-up voltage is 2.3V, so when performing this test, start above 2.3V to start the transmitter. The transmitter shuts down at 1.5 voltage.
4. Verify that the CHANGE BATTERY LED starts flashing when the power supply is adjusted to 1.9V.
5. Admit the transmitter to the Clinical Information Center and verify that the *Change Battery* message appears at the CIC and the CHANGE BATTERY LED flashes on the transmitter.

RF Test

The following series of tests verify operation of the transmitter's RF circuitry.

Power Output

This test measures the power output of the transmitter. Prepare the RF monitor as shown in the following diagram.



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Reference the RF monitor operator's manual for setup information. Allow the RF monitor to operate for at least 15 minutes for temperature stabilization.

Configure the RF monitor as follows:

1. Set the center frequency to the frequency of the transmitter. Refer to the chapter 3, Installation for a TTX cross-reference list.
2. Set the span to 500KHz (50KHz/div).
3. Set the amplitude to -10dBm at 10dB/div.
4. Connect the transmitter with lead wires to a patient simulator as shown in above diagram.

   NOTE

   The transmitter does not radiate RF energy when in a leads fail condition.

5. Wrap the leadwires around the antenna of the RF monitor and verify that a peak signal of at least -20dBm can be obtained. It may be necessary to move the transmitter and leadwires around to obtain this peak signal.

   NOTE

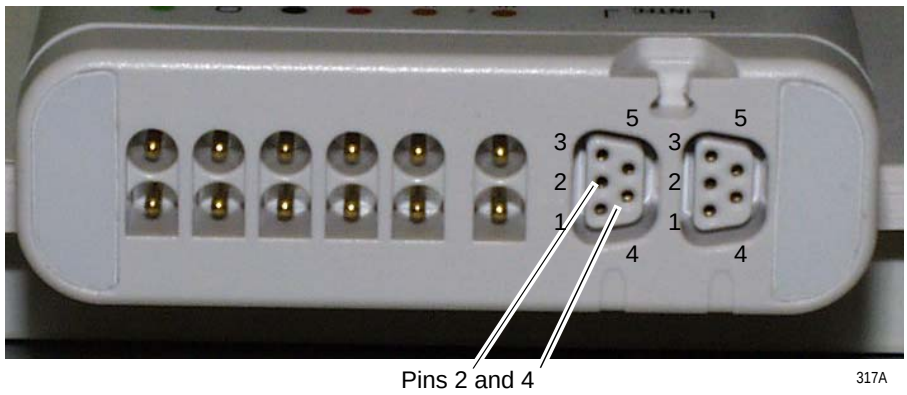
   If the RF Monitor has a Max Hold function, then enable the max hold to help detect the RF peak signal strength.

Carrier Frequency Error

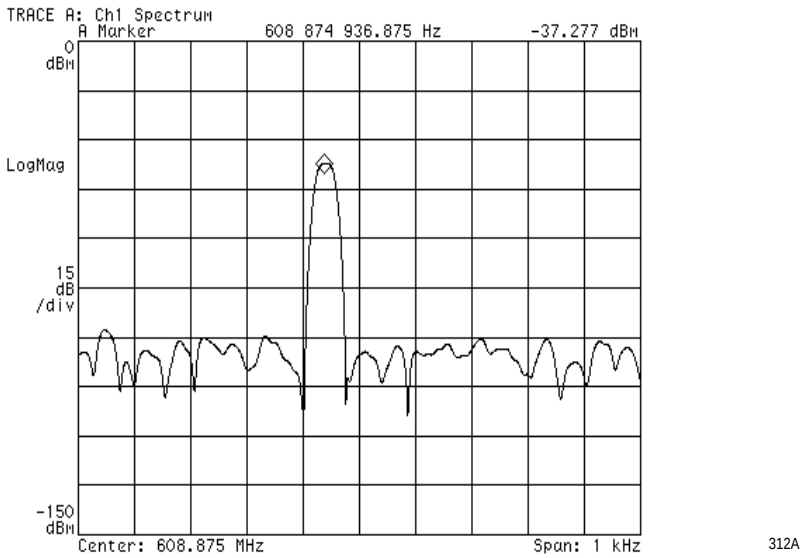
This test checks the carrier frequency to verify that it is within the programmed range. Refer to the RF monitor operator's manual for the setup information.

1. Use the same setting on the RF Monitor as described in step 1 above except change the span to 1KHz.
2. To measure the center frequency of the ApexPro transmitter, use the manufacturing code.
   - Short pins 2 and 4 on either one of the interface connector ports.
   - Power up the transmitter.

     This forces the transmitter to run the manufacturing code, which outputs a test pattern that can be measured accurately for center frequency.



3. Verify that the peak signal is ±650Hz from the assigned center frequency as shown in the diagram below.



4. If the transmitter fails either the Power Output test or the Carrier Frequency error test, then return to factory for service.

This completes the RF checkout. Remove the jumper from the interface connector port. When the jumper is removed the transmitter resets and returns to normal operation mode.

RF Signal Integrity

This test verifies the RF output of the transmitter.

1. Connect the transmitter to an ECG simulator. Position the transmitter approximately 10 to 20 feet (6 meters) from an antenna.
2. At the CIC, click *Setup CIC*.
3. Click the *Service Password* tab.
4. Type password, **mms_com** and press **Enter**.
5. Type in the command, **setflags -dup on** and press **Enter**. This allows a duplicate TTX for 5 minutes.
6. At the MS DOS prompt, type **setflags -mark ttx** and press **Enter**. This function plots many causes of dropout.

   The color diagnostic tic marks at the bottom of each window indicate the reason for missing waveform data. The following table lists the colors and their indication.

Color	Indication
Yellow	Missing data from the transmitter
Dark Green	Missing data from the receiver
Magenta	Missing data from the receiver system
Orange	Missing data from the hardware manager
Light Gray	Invalid telemetry data

7. On the admitted beds, observe the simultaneous ECG waveforms for signal integrity. There should be no ECG signal breakup (dropout) on any of the waveforms.

If an ECG signal breakup is observed on more than one receiver the transmitter may require service.

Communications Tests

The following series of tests verify that the transmitter is operating properly with the receiving system and the monitoring network. A Clinical Information Center that has access to the receiver system is required.

Lead(s) Fail

This test verifies that the transmitter can test for, and indicate, good lead signals.

1. Attach the leadwires to an ECG source and to the transmitter.
2. Install batteries in the transmitter.
3. Admit the transmitter to an available receiver at the CIC. Verify that the ECG signals display at the CIC.

   NOTE

   It takes approximately 10 seconds for the transmitter to display waveforms for a 3-lead cable.

4. Press the **Verify Leads** button. The **Lead Status** and **Change Battery** LEDs flash twice to acknowledge that the button was pressed. The lead status displays for approximately 1 minute. Lead status LEDs for good leads remain illuminated for the time period.
5. Verify, both at the CIC and on the transmitter, Lead Status each time with a different lead wire removed from the ECG source. The LED associated with the disconnected leadwire should not remain illuminated and the associated lead should show lead fail at the CIC.

   NOTE

   In 3-lead mode, the reference lead is always displayed as “Good” during the “verify leads” test.

   NOTE

   If a multi-lead cable is used on a “single-lead only” transmitter, the LEDs for connected V leads flash once per second during the “verify leads” period.

Verify Graph Request

This test verifies that pressing the **Graph** button results in a graph run at the assigned printer device.

1. Configure the Clinical Information Center so that graph requests (from the transmitter) are printed at the Clinical Information Center.
2. Press the **Graph** button. The Lead Status and **Change Battery** LEDs flash twice to acknowledge that the switch was pressed.
3. Verify that a graph run occurs at the printer.

Pause Alarm

This test verifies that the transmitter enters into the PAUSE ALARMS condition for approximately five minutes.

1. With the transmitter operating, press the **Graph** and **Verify Leads** buttons simultaneously. The LEAD STATUS and **Change Battery** LEDs flash twice to acknowledge the switch was pressed.
2. Once the transmitter enters the PAUSE ALARMS condition the **Pause Alarm** LED begins flashing, and flashes for the programmed period. (Typically five minutes but this value can be changed by reprogramming the transmitter.)
3. At the end of the period the **Pause Alarm** LED stops flashing.
4. Terminate the PAUSE ALARMS condition by pressing the **Verify Leads** and **Graph** buttons simultaneously. The **Pause Alarm** LED stops flashing.

Pacemaker Transmission

This test verifies detection of a pace pulse and transmission to the Clinical Information Center display.

1. Connect an ECG simulator to the transmitter.
2. With the transmitter operating and ECG waveforms from the transmitter displaying on the Clinical Information Center, trigger a pace pulse at the ECG simulator.
3. Verify a pace mark on the Clinical Information Center. (Ensure that the PACE function is enabled on the Clinical Information Center.)

ECG Waveform Transmission

This test measures the gain through the transmitter/receiver system.

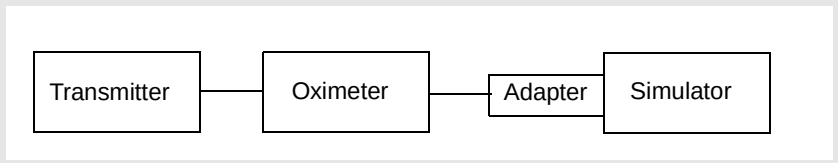
1. Connect the ECG simulator to the transmitter.
2. Verify that ECG signals from the transmitter display at the Clinical Information Center.
3. Verify the ECG gain at the Clinical Information Center is set to 1X.
4. Trigger a Graph run at the transmitter.
5. Measure the graph output. Signal level should be 1 cm (two large boxes on graph strip) for a 1 mV input.

Completion

If the transmitter fails any of the above tests, return it to GE for repair.

Apex Oximeter and Nonin Xpod Oximeter Operational Tests

This test verifies the functionality of the Apex Oximeter and the Nonin Xpod oximeter.

<table>
<tr><th>Apex Oximeter</th><th>Nonin Xpod oximeter</th></tr>
<tr><td colspan="2">1. Record the oximeter's serial number.
2. Connect the oximeter to the ApexPro transmitter.
3. Admit the transmitter to an ApexPro telemetry system. Make sure that the SpO_2 parameter box comes up on the Clinical Information Center. If the oximeter fails, discontinue the test. Return or repair the oximeter after double-checking the test setup.</td></tr>
<tr><td>4. Place the oximeter in continuous display mode by pressing and holding the Display On/Off switch for 2 seconds.</td><td>4. Go to step 5.</td></tr>
<tr><td colspan="2">5. Connect the oximeter to the pulse oximeter simulator using the Nonin simulator cable adapter (p/n 420970-901).
 

6. Set the simulator's selector switch to "Nellcor" and check the heart rate accuracy.
◆ Accuracy specification for 18 – 300 BPM is +/– 3% or +/–1, whichever is greater.
◆ Adjust the RATE (BPM) switch to vary the heart rate.
◆ Set the RATE to 70 BPM. Accuracy at 70 BPM is +/–2. Repeat for 100 BPM (+/–3) and 160 BPM (+/–5).</td></tr>
<tr><td colspan="2">7. Set the simulator to 68.4% (use the white Nellcor numbers). Accuracy at 68% is +/–3. Repeat for 90.6% (+/–3), 96% (+/–3), and 99% (+/–3).</td></tr>
<tr><td>8. Check the perfusion indication. Change the selector switch to "Ohmeda" and verify that the perfusion LED changes to yellow.</td><td>8. Go to step 9.</td></tr>
<tr><td>9. Disconnect the oximeter from the simulator.
◆ The indicator illuminates in front of the SpO2 value on the oximeter.
◆ A CHECK PROBE message appears on the Clinical Information Center.</td><td>9. Disconnect the oximeter from the simulator.
◆ A CHECK PROBE message appears on the Clinical Information Center.</td></tr>
</table>

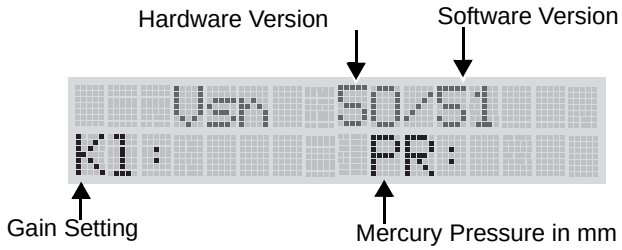
Accutracker DX NIBP Operational Tests

NOTE

If the Accutracker fails any test, return the unit to GE Medical Systems *Information Technologies* Service and Supplies. See "How to Reach Us" in the front of this manual.

Accutracker Display

The following displays on the Accutracker when you turn it on (press and hold the button while turning the switch on). This display includes hardware and software version, the Gain Setting for the mic, and the pressure setting (mmHg).



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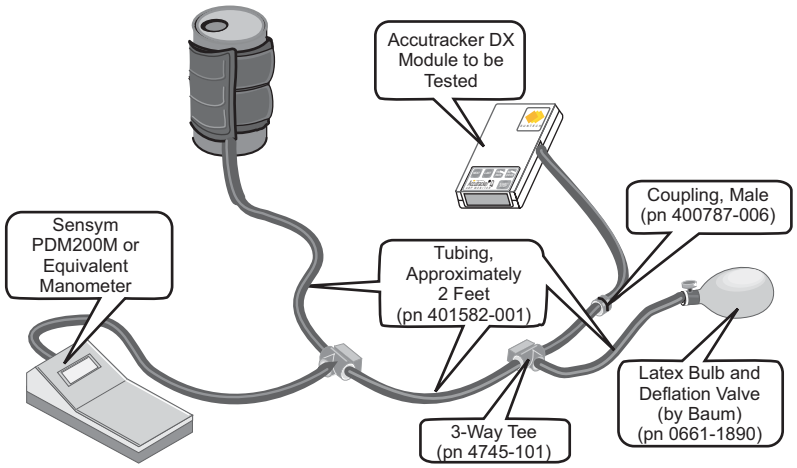
Pressure Calibration Check

The following test ensures the functionality of the Accutracker DX Noninvasive Blood Pressure monitor.

1. Connect the PDM200 or Mercury manometer to the patient cable/cuff connection.


Accutracker DX Module to be Tested
Coupling, Male (pn 400787-006)
Sensym PDM200M or Equivalent Manometer
Tubing, Approximately 2 Feet (pn 401582-001)
Latex Bulb and Deflation Valve (by Baum) (pn 0661-1890)
3-Way Tee (pn 4745-101)

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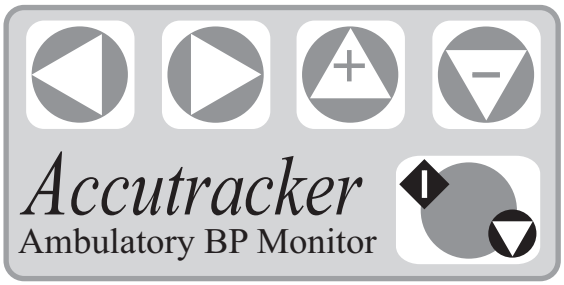
NOTE

Make sure no external pressure is applied to the Accutracker when you turn it on.

2. Press and hold the ◁ button and turn the Accutracker on. The unit is now in Technical Calibrate mode and valve #1 is closed.



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3. Apply pressures to the Accutracker between 0mmHg and 250mmHg in increments of 50mmHg. Make sure there is no more than a +/– 2mmHg difference between the mercury column or PDM200 display and the Accutracker display value.
4. Turn off the Accutracker.
5. After five seconds (to prevent the unit from "locking up"), press and hold the ◁ button and turn the Accutracker on.
6. Press the ▽ button twice; then press the ▷ button to force the Accutracker to activate the pump and valve circuitry. The unit goes through a diagnostic self-test. If the unit passes the test, TEST PASSED displays briefly.
7. When OFFICE SELF TEST displays, *immediately* press the button to discontinue the reading in progress. This step is necessary to identify that a reading can be aborted, if necessary, during a test in case there is a problem (i.e., the cuff slips down the arm, an electrode becomes detached, etc.).
8. Turn the Accutracker off to exit this mode.

Over-Pressure Release Check

The Over-Pressure release occurs whenever a pressure of 285mmHg (+/–20mmHg) is applied to the Accutracker pressure transducer. The Over-Pressure release forces the pump to stop and valve #1 to open.

1. Press and hold the ◁ button and turn the Accutracker on.

   NOTE
   Make sure no external pressure is applied to the Accutracker when you turn it on.

2. Apply a pressure of 285mmHg (+/–20mmHg) to the Accutracker. Valve #1 immediately opens and allows the applied pressure to release.
3. Once the Over-Pressure circuit is tripped, valve #1 and the pump are disabled until "Analog Power" (+/–Vana) is removed from the circuit. Turn the Accutracker off to reset the circuit.

Hardware Time-Out and System Leak Check

1. Press and hold the button and turn the Accutracker on.

   NOTE
   Make sure no external pressure is applied to the Accutracker when you turn it on.

2. Apply 200mmHg pressure to the Accutracker pressure circuit and start a timer to clock the Hardware Time-Out circuit.
3. The Hardware Time-Out occurs in three minutes (+/–45 seconds). Valve #1 opens and dumps pressure once the time-out is finished. As you monitor the Time-Out, monitor the pressure (in mmHg) displayed on the Accutracker LCD. The Accutracker should leak no more than 2mmHg per minute.

Communication Test

This procedure verifies that the telemetry system transmits and receives the data correctly from the Accutracker.

1. Attach the Accutracker to the ApexPro Telemetry system.

   NOTE
   You must have ECG leads with a shorting cable or simulator attached to the ApexPro Telemetry system for this test to work.

   CAUTION
   Refer to the operator's manual for proper operation guidelines and cuff/microphone placement.

2. Place blood pressure cuff on the arm.
3. Turn the Accutracker on and press the button.
4. When the display appears on the system screen, verify that the Accutracker display numbers match the display numbers.
5. Turn Accutracker off.

PM Inspection Form

Due to continuing product innovation and because specifications in this manual are subject to change without notice, a preventive maintenance (PM) form is no longer printed with this manual. For the latest PM form regarding this product, contact GE Medical Systems *Information Technologies* Service.

If repairs/adjustments are made or you replace any parts, describe this in the area provided on the PM form.

Include any comments regarding any unusual environmental conditions that may affect the operation or reliability of the equipment in the area provided on the PM form.

On the following pages a repair log is included for your convenience to record the repair history of this product.

Repair Log

Unit Serial Number:
Institution Name:

Date	Maintenance/Repair	Technician

5 Troubleshooting

For your notes

Before Calling Service

Before calling service on a transmitter that may appear to be operating incorrectly or may have failed, check the following:

Transmitter

Frequent Lead Fail

- Swap the leadwire set with either a new set or a known good set. Leadwires may have hidden internal damage that can cause signal failure.
- Leadwires may become brittle or damaged after frequent cleanings. Inspect them before each use and replaced if damaged.
- Leadwires that have been wrapped around the transmitter are more likely to be damaged. Use a transmitter holder when the transmitter is not in use. Leadwires should be either laid out flat or hung up such that there are no kinks or sharp bends in the wires.
- Check the electrodes on the patient. Improper preparation can cause Lead Fail events.
- Should Lead Fail events continue to occur regularly a call for service may be necessary.
- If, after powering up the transmitter, only the RA LED flashes rapidly:
  - The transmitter has lost its memory.
  - The application code contained in the EEPROM has been erased or corrupted.
  - The transmitter needs to be reprogrammed.
  - Return the transmitter to the factory for service.

- If, after powering up the transmitter, only the LA LED flashes rapidly:
  - The transmitter has lost its memory.
  - The manufacturing/service code contained in the EEPROM has been erased or corrupted.
  - The transmitter needs to be reprogrammed.
  - Return the transmitter to the factory for service or contact Technical Support.

- If a functional multi-lead cable is connected to a transmitter, but only a single lead is displayed at the CIC:
  - The transmitter is configured for single lead and it must be upgraded for multi-lead use.
  - Please check the transmitter's features. Refer to "Start Up" on page 2-6 to verify the features of your transmitter.

Short Battery Life

- Install a new set of alkaline AA batteries into the transmitter and then verify battery life.
- Once used in a transmitter for any length of time, dispose of (recycle) used batteries immediately.
- Batteries must NOT be re-used. Use batteries for only one patient. DO NOT store used batteries for use with the next patient. A battery contains a finite amount of stored energy. Each unit of time a battery is used diminishes the amount of stored energy. Installing a used battery in a transmitter results in a greatly reduced, and unpredictable, monitoring period.
- NEVER use a battery beyond the recommended expiration date for the battery. The amount of stored energy in the battery may not be sufficient for proper monitoring.
- DO NOT use rechargeable batteries. The transmitter circuitry, Apex Oximeter, and the Accutracker were designed for the power output characteristics of alkaline batteries.

  NOTE

  Rechargeable batteries DO NOT store as much energy as alkaline batteries and have very different output characteristics. The monitoring period may be greatly shortened and the specified low-battery warnings may be adversely affected or possibly not even displayed.

- If, after working through the above steps, your transmitter still has a short battery life, a call for service may be necessary.

Waveform Dropout

- To determine the type of dropout, enable flags as described in "RF Signal Integrity" on page 4-16.
- If out of antenna range, position the transmitter within range of the antenna.
- For external RF interference, use the spectrum analyzer to verify the external noise and reprogram the transmitter if necessary.
- If you suspect a bad transmitter, perform check out procedure and return to service if defective.

Apex Oximeter and Nonin Xpod Oximeter

Message	Cause	Solution
Check Probe	■ Probe is disconnected. ■ Sensor is defective.	■ Connect the probe to the oximeter. ■ Replace the defective probe.
Low Quality Signal	■ Poor patient connection. ■ Probe is defective.	■ Attach the probe to the patient. ■ Replace the probe.
Probe Off	■ Probe is off of the patient. ■ Sensor is defective.	■ Attach the probe to the patient. ■ Replace the sensor.
No SpO2 Data	■ ApexPro transmitter not being used. ■ Oximeter is disconnected from the transmitter. ■ Patient is out of antenna range. ■ ApexPro transmitter is not configured to collect SpO2 data.	■ Replace transmitter with ApexPro transmitters. ■ Connect oximeter to transmitter. ■ Move patient within antenna range. ■ Activate the transmitter's interface connector ports.
The Saturation Value is "x"	■ Patient is out of antenna range. ■ Oximeter is disconnected from the transmitter.	■ Move patient within antenna range. ■ Connect oximeter to transmitter.

NOTE

The Saturation Value is "x" message remains on the Clinical Information Center for 3 minutes. If no data is detected after 3 minutes, the message changes to *NO DATA*.

Apex Oximeter Short Battery Life

- A low battery condition is indicated by the Apex Oximeter display flashing and displaying a message at the Clinical Information Center. If the batteries are not changed within one hour, the oximeter's display flashes dashes, the sensor LED turn off, and no data displays on the Clinical Information Center.
- Install a new set of alkaline AA batteries into the oximeter and then verify battery life.
- Once used in an oximeter for any length of time, dispose of (recycle) used batteries immediately.
- Batteries must NOT be re-used. Use batteries for only one patient. DO NOT store used batteries for use with the next patient. A battery contains a finite amount of stored energy. Each unit of time a battery is used diminishes the amount of stored energy. Installing a used battery in an oximeter results in a greatly reduced, and unpredictable, monitoring period.
- NEVER use a battery beyond the recommended expiration date for the battery. The amount of stored energy in the battery may not be sufficient for proper monitoring.
- DO NOT use rechargeable batteries. The oximeter circuitry was designed for the power output characteristics of alkaline batteries.

NOTE

Rechargeable batteries DO NOT store as much energy as alkaline batteries and have very different output characteristics. The monitoring period may be greatly shortened and the specified low-battery warnings may be adversely affected or possibly not even displayed.

- If, after working through the above steps, your oximeter still has a short battery life, a call for service may be necessary.

Powerup Selftests

Transmitter

The ApexPro transmitter performs a limited amount of testing of the internal memory components when it powers up. The results of these tests are indicated by the LEDs on the transmitter case. Test results may also be viewed on a remote terminal or personal computer if the ApexPro transmitter programming box is connected and in use.

NOTE

The LED start up sequence indicates which transmitter features are enabled. Please refer to the table in "Start Up" on page 2-6 for an explanation of the LED start up sequence.

To start the tests, install new batteries into the transmitter. The internal digital signal processor performs the selftests automatically.

NOTE

Any test failures are stored and appear when you view TTX information during programming of the transmitter. Stored errors can only be cleared by reprogramming the transmitter.

The following tests are performed at powerup of the transmitter.

1. First a RAM test is performed. Either the RAM in the transmitter's digital signal processor circuit passes or fails this test.
   - If the RAM passes, the testing continues.
   - If the RAM fails the test, the RAM test is repeated and continues in a loop as long as the test fails and power is applied to the transmitter.
2. Next the EEPROM test is performed.
   - If the EEPROM passes, the testing continues.
   - If the EEPROM fails the test, the EEPROM test is repeated and continues in a loop as long as the test fails and power is applied to the transmitter.
3. Finally, the transmitter's frequency synthesizer is programmed with the specified customer's frequency. A test is performed to verify a successful lock of the synthesizer circuits.
   - If the synthesizer lock test passes the transmitter starts normal operation.

If an error is detected the transmitter resets itself.

Apex Oximeter

The following is the Apex Oximeter powerup sequence:

1. The display reads *888 888* and the perfusion LED is red for approximately one second.
2. The display reads *888 888* and the perfusion LED is green for approximately one second.
3. The software revision level displays for 1-2 seconds and the perfusion LED is off.
4. The display goes to **- -** and there is a flashing dash in the upper left-hand corner of the SpO_2 display.

If the unit functions properly, these indications occur in the specified order.

Nonin Xpod Oximeter

The oximeter does not contain a power supply, as it draws power from the ApexPro transmitter. Consequently, there is no power up sequence. The unit only functions when connected to the telemetry system.

Accutracker

The Accutracker error codes are translated in the software to display on the system monitor. See the operator's manual for your system for an explanation of error codes.

Power Shutdown During Leads Fail

If all leads fail for more than about six seconds the digital signal processor shuts off power supplied to the RF output amplifier. This reduces the battery discharge rate when no data actually transmits.

Once the leads are reconnected, about one second is required for the digital signal processor to power up the RF circuitry and resume transmitting patient data.

For your notes

6 Upper Level Assembly

For your notes

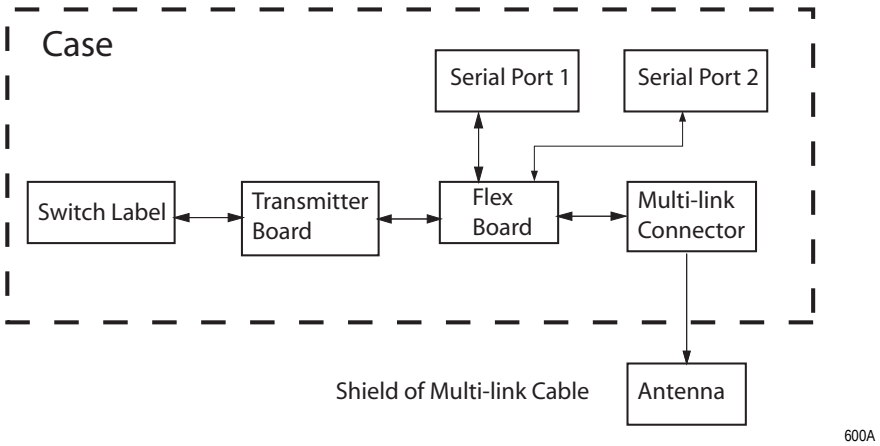
Versions of the Assembly

There are two versions of the ApexPro telemetry transmitter assembly. Make sure to reference the correct parts list and exploded view for your version of transmitter.

Upper Level Part Number	Frequency Type	Frequency Range	PCB Part Number
418500-001	UHF for U.S.	584 – 613.975 MHz	801590-001 801590-006
418500-003	UHF for International	420 – 460 MHz	801590-008
418500-005	UHF for Japan	420 – 460 MHz	801590-010

Theory of Operation

Block Diagram



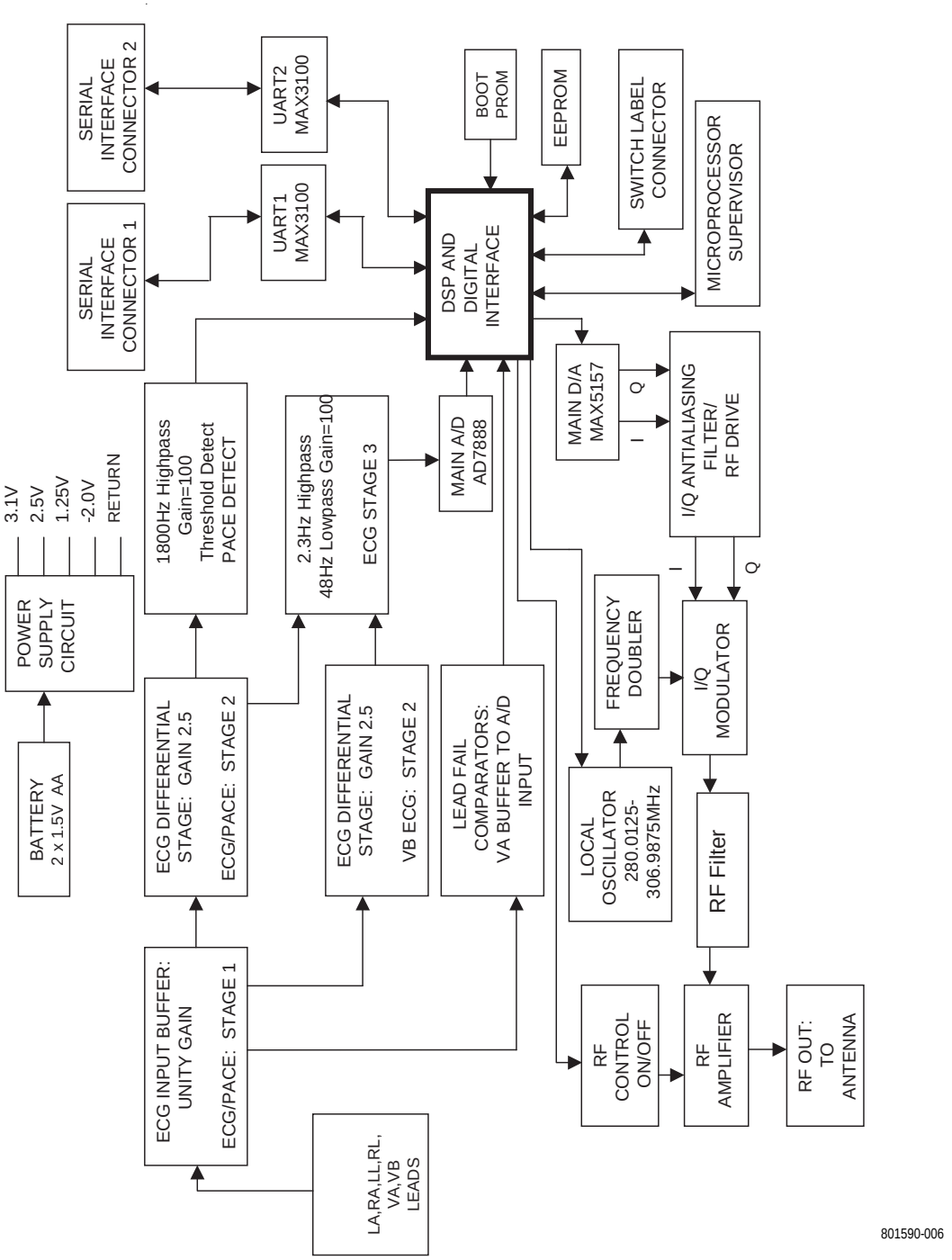
Main Components of the Assembly

The main components of the assembly include the populated transmitter board, flex board, gasket, switch label, and the identification labels. The populated board contains all of the active components and software. The assembly includes the flex board (418490-00X) which connects to the transmitter board through J1. The assembly includes the switch label, which is attached to the transmitter case with a self-adhesive backing. The tail of the switch label is fed through a hole in the case and attached to the transmitter board through J2.

Transmitter Circuit Board Assembly

The core of the assembly is the populated transmitter board (801590-0XX). This board contains the majority of the active components including the software.

The following block diagram shows that the transmitter is separated into various functional blocks to describe the sections of the board and their components. This functional block diagram not only shows the functional blocks, but it also shows how they are related to one another.



Flex Circuit Board Assembly

The flex contains the front end Multi-link ECG connector and the two five-pin interface connector ports. The other end of the board contains a twenty pin surface mount connector that interfaces to the transmitter board via J1. The flex contains six carbon resistors. The reason for the resistors is to prevent Defibrillator damage to the transmitter board. This board also contains the trace that routes the RF to one of the shield wires for use as an antenna.

Gasket

The gasket is placed around the end cap of the flex board. The main purpose of this gasket is to prevent any fluid from leaking into the case that could cause damage to the transmitter board.

Case

The case is ultra-sonically welded together enclosing the battery door in a sliding groove. The battery compartment is along one side of the case.The transmitter board is slid into the case part way. The flex board containing the gasket is attached via J1. The switch label tail is connected to J2 on the transmitter board. The board is then slid in the rest of the way. The flex board is folded back and the battery terminal screw is inserted. Once in place, the flex board is folded in and connected to the case. The four screws are inserted to insure a good seal.

Switch Label

The switch label consists of seven LEDs and two push buttons. The switch label has an adhesive back and a flexible tail. The tail is fed through a hole in the case to be attached to the transmitter board via J2. This hole is covered up by one of the labels.

NOTE

The LED start up sequence indicates which transmitter features are enabled. Please refer to the table in "Start Up" on page 2-6 for an explanation of the LED start up sequence.

Labels

There are five adhesive labels. The front label covers the switch label sealing the hole that the tail fits through. This label also identifies each LED and switch. The back label covers a number label. The back label contains a window for viewing the serial number. It also contains any of the markings required for each country (FCC, UL, etc.) and the ECG orientation chart. This label also provides the color coordination for the multi-link cables. A small picture indicating the battery orientation is molded into the case as well. Two more self-adhesive labels cover up the screws on the end cap connector. These labels reveal the enabled features on the transmitter.

NOTE

Please refer to "Configurations" on page 2-4 for a guide to the screw cover labels and the features associated with them.

Interfaces

ECG Multi-link

The ECG connector is designed to accept six, five, or three lead multi-link cables. The ECG data is acquired off of the patient through a set of leadwires. The signals are then amplified, processed, and transmitted.

Interface Connector Ports

When enabled, interface connector ports provide an asynchronous communication connection to other devices (NBP, SpO_2, etc.) for extra monitoring or for service connection to a programming box. The device ID pin voltage selects the transmitter's mode of operation. Attaching a 100Ω resistor from the ID line to ground puts the transmitter in service mode. No voltage divider causes normal operation.

Switches/LEDs

When power is applied to the transmitter, all of the LEDs should flash rapidly indicating code is being loaded. The code is done loading and executed when just the top row of LEDs flash twice.

The two switches perform their functions as labeled. Pressing the **Verify Leads** button enables the good lead LEDs. After this button is pressed, the LEDs for good leads are illuminated for one minute. If your transmitter is configured for single lead only, the LEDs for connected inactive leads will flash for one minute. Pressing and releasing the **Graph** button causes either a save or a manual graph at the CIC. Depressing both verify leads and graph together causes an alarm pause condition for the programmed amount of time (typically five minutes) or until the alarm pause action is initiated again. When the transmitter is in alarm pause, the corresponding LED flashes once every second at a 1/8th duty cycle. When the battery voltage drops below 1.9 volts, the change battery LED flashes once every second at a 1/8 duty cycle. Upon any activation (Verify Leads, Graph, or Alarm Pause) the top row of LEDs flash twice. All of these functions are disabled in service mode.

RF

The RF output is transmitted through one of the shield wires on the multi-link cables. The carrier frequency can be programmed to any frequency within the allowable band.

Setup and Configuration

Program Code Storage

Executable program code for the main processor is stored in non-volatile programmable memory. Program code can be changed via an interface connector port using the PC-based programming box software or a HyperTerminal program and a programming box. The version of the currently stored code displays using the PC programming box software 2004458-001.

Error Log

The transmitter contains an error log in its non-volatile programmable memory. When a synthesizer lock error occurs, this is logged and latched into the appropriate memory space. When a checksum error on start-up occurs, this is logged into the appropriate memory space for this as well. The error log can be viewed using the programming box PC software or a HyperTerminal program. This reports both of these errors as well as a real time report of the synthesizer lock status.

Parameters

There are parameters that are programmable and viewable. Using HyperTerminal or the ApexPro PC programming box software, certain fields can be viewed and changed while in service mode:

Parameter	Status
TTX / Frequency	Read / Write
Board Version	Read
Synthesizer Lock Error Log	Read / Clear
EEPROM Checksum Error Log	Read / Clear
Synthesizer Lock Status	Read
Serial Number	Read / Write
Reference Lead (3-lead)	Read / Write
Alarm Pause Time	Read / Write
Code Version (Application)	Read
Code Version (Manufacturing / Service)	Read
Filter	Read / Write
I/Q Table Version	Read
I/Q Table	Write
Battery Voltage	Read
Battery Status	Read
Lead Status	Read
Button Status	Read
App Code	Write File
Mfg Code	Write File

Manual TTX View/Program

The transmitter frequency or TTX can be changed or viewed without a programming box. The transmitter always loads code on power up.

View

1. Power up the transmitter. This causes the service code to load (indicated by all LEDs flashing).
2. Hold down the **Verify Leads** button and the **Graph** button while the transmitter loads code and before the top row of LEDs flash twice. Continue to hold the **Verify Leads** and **Graph** buttons**.**

   This displays the TTX number using the first four LEDs.

   - The first four LEDs light up indicating it is going to display the four digit TTX number.
   - Next the RA LED flashes a number of times corresponding to the first digit of the TTX number. The flashes are from one to ten with ten flashes representing a zero digit.
   - Then the LA LED flashes corresponding to the second TTX digit. The LL LED corresponds to the third digit and the Va LED corresponds to the fourth TTX number.
3. Write down the TTX numbers as they display.

NOTE

FOR JAPAN ONLY. The TTX number is NOT the channel number. Refer to the TTX ID Number/Channel chart found in chapter 3, "ApexPro (Type B devices) TTX Frequency Chart" on page 3-37.

Program

Programming the TTX number manually requires pin 4 of any interface connector port shorted to pin 2 of any interface connector port.

1. Short connector pins.
2. Power up the transmitter. This causes the service code to load (indicated by all LEDs flashing).
3. Hold down the **Verify Leads** button and the **Graph** button while the transmitter loads code and before the top row of LEDs flash twice. The first four LEDs of the top row light up indicating it is in manual TTX program mode.
4. Release the **Verify Leads** and **Graph** buttons.

   RA flashes, corresponding to the number of the first digit of the TTX number.

NOTE

FOR JAPAN ONLY. The TTX number is NOT the channel number. The transmitter must be programmed with a TTX number for proper operation. Use the charts in chapter 3, "ApexPro (Type B devices) TTX Frequency Chart" on page 3-37 to match a channel number with its corresponding TTX number. See the programming kit instructions for more information.

5. Increment the first digit by pressing the **Verify Leads** button until the LED begins to flash again.
6. Release the button.

   The LED flashes the number corresponding to the new digit.
7. Accept and proceed to the next digit by pressing the **Graph** button until the next LED flashes.
8. Release the button.

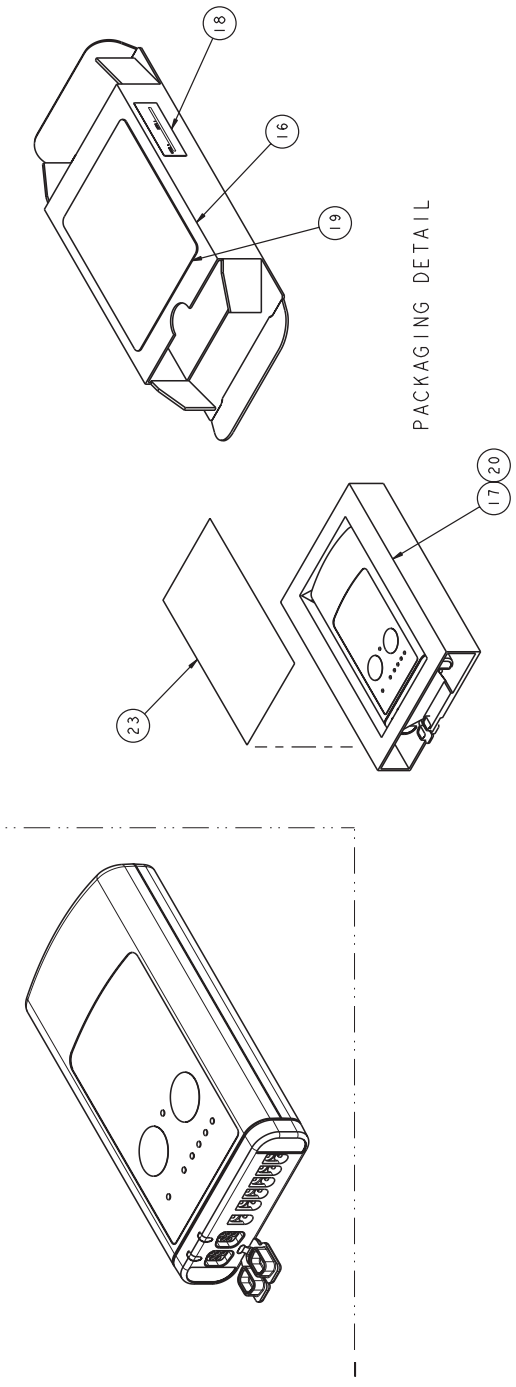
   The TTX number is not changed until the fourth digit is accepted by pressing the **Graph** button. The top row of LEDs flash twice upon acceptance of the TTX number and the service program runs until the short is removed. Then the transmitter reloads the application code and continues to run normally at the new TTX number.

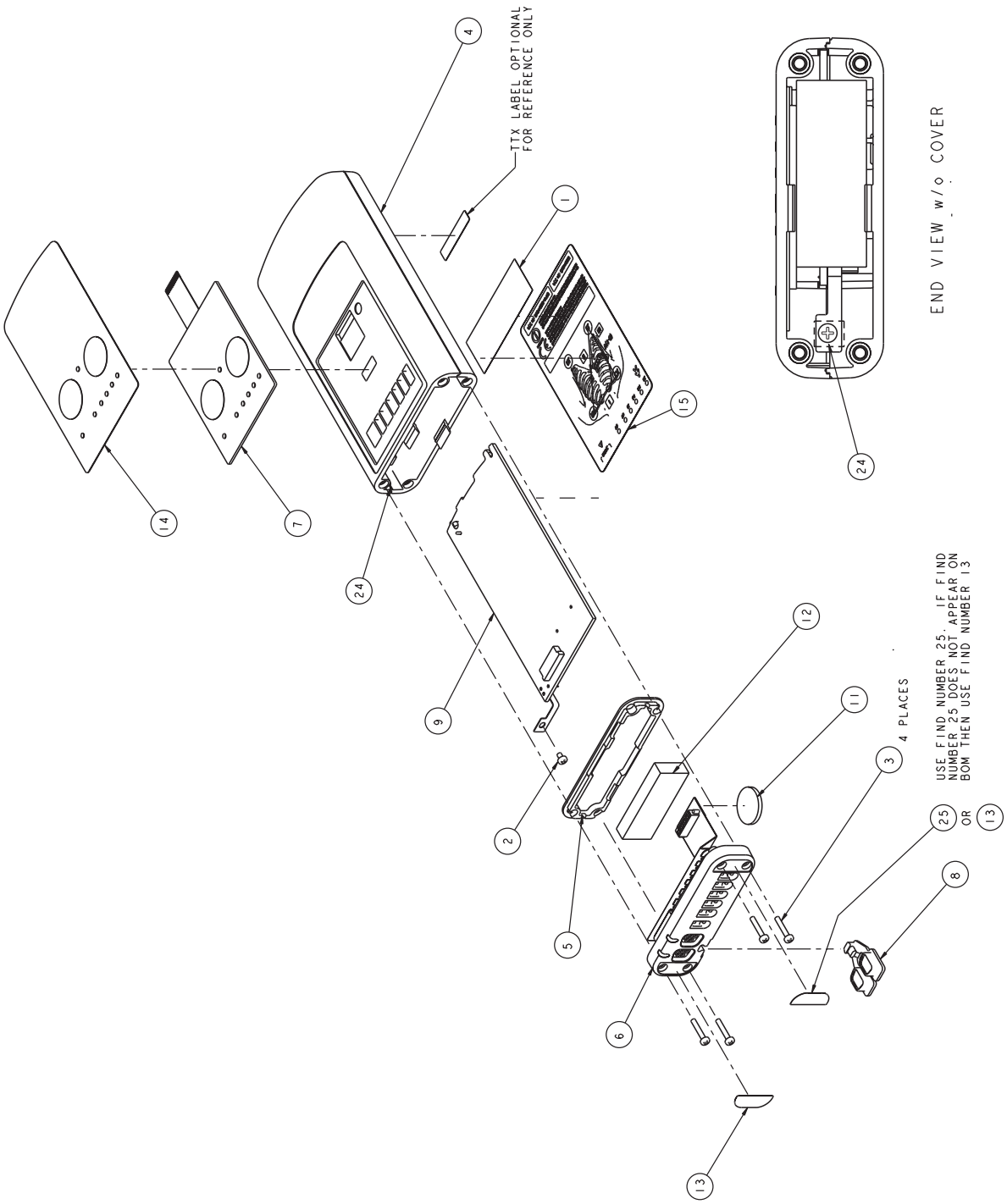
Interconnect Cables

The following table shows the interconnect cables used to connect the ApexPro transmitter with other devices.

Device	Part Number
SpO_2 interface cable	418497-001
Suntech Accutracker interface cable	2002370-001
DinaLink™ interface cable assembly	418497-002

Exploded View 418500E




TTX LABEL OPTIONAL
FOR REFERENCE ONLY
END VIEW w/o COVER
USE FIND NUMBER 25. IF FIND
NUMBER 25 DOES NOT APPEAR ON
BOM THEN USE FIND NUMBER 13
OR
4 PLACES

ApexPro Transmitter Parts List 418500-001K

Find Num	Item Number	Item Description	Qty
1	404525-001	LABEL BLANK 2 X 3/4	1
2	411508-002	SCREW METRIC PH M2 X 3 W/COAT	1
3	411508-003	SCR METRIC PH SST M2 X 10 W/COAT	4
4	418480-001	ASSY TRANSMITTER CASE	1
5	418481-001	XMTR CONN INTERFACE GSKT	1
6	418490-001	ASSY APEX-PRO CONNECTOR INTERFACE	1
7	418495-001	TRANSMITTER MEMBRANE SWITCH	1
8	421732-002	SERIAL INTERFACE COVER	1
9	801590-006	PCB APEXPRO TRANSMITTER 584-614 MHZ	1
11	4825-010	FASTENER HOOK VELCRO 5/8DIA	1
12	2003728-001	PAD FOAM 40X15X5.5	1
13	2006763-001	LABEL APEXPRO NO SERIAL PORT ICON	0
14	*2006130-001	LABEL APEXPRO FRONT AHA ENG	0
15	*422196-001	LABEL APEXPRO BACK AHA DMSTC	0
16	2002716-001	BOX MAILER SMALL 4.63 X 1.38 X 6.38	0
17	2002716-002	PACKAGING INSERT CORRUGATED APEX	0
18	404525-001	LABEL BLANK 2 X 3/4	1
19	422159-087	LABEL CARTON APEXPRO TRANSMITTER	1
20	9976-005	BAG ANTI-STATIC 6.00W X 8.00L	1
23	2001989-014	INSTR SVCE APEXPRO TRANSMITTER PROG ENG	1
24	4851-116	ADH POTTING COMPOUND CLEAR DP-270	1
25	2006761-001	LABEL APEXPRO SINGLE LEAD ENG	0

* Refer to the Label Parts List—2002553 to order these labels.

ApexPro Transmitter Parts List 418500-003E

Find Num	Item Number	Item Description	Qty
1	404525-001	LABEL BLANK 2 X 3/4	1
2	411508-002	SCREW METRIC PH M2 X 3 W/COAT	1
3	411508-003	SCREW METRIC PH SST M2X12 W/COAT	4
4	418480-001	ASSY TRANSMITTER CASE	1
5	418481-001	XMTR CONN INTERFACE GSKT	1
6	418490-001	ASSY APEX-PRO CONNECTOR INTERFACE	1
7	418495-001	TRANSMITTER MEMBRANE SWITCH	1
8	421732-001	SERIAL INTERFACE COVER	1
9	801590-008	PCB APEXPRO TRANSMITTER 420-460 MHZ	1
11	4825-010	FASTENER HOOK VELCRO 5/8DIA	1
12	2003728-001	PAD FOAM 40X15X5.5	1
13	*422227-001	LABEL APEXPRO SCREW COVER	0
14	*2006130-001	LABEL APEXPRO FRONT AHA ENG	0
15	*422196-002	LABEL APEXPRO BACK AHA INTL	0
16	2002716-001	BOX MAILER SMALL 4.63 X 1.38 X 6.38	0
17	2002716-002	PACKAGING INSERT CORRUGATED APEX	0
18	404525-001	LABEL BLANK 2 X 3/4	1
19	422159-087	LABEL CARTON APEXPRO TRANSMITTER	1
20	9976-002	BAG ANTI-STATIC 4.00W X 8.00L	1
23	2001989-014	INSTR SVCE APEXPRO TRANSMITTER PROG ENG	1

* Refer to the Label Parts List—2002553 to order these labels.

ApexPro Transmitter Parts List 418500-005A

Find Num	Item Number	Item Description	Qty
1	404525-001	LABEL BLANK 2 X 3/4	1
2	411508-002	SCREW METRIC PH M2 X 3 W/COAT	1
3	411508-003	SCR METRIC PH SST M2 X 10 W/COAT	4
4	418480-001	ASSY TRANSMITTER CASE	1
5	418481-001	XMTR CONN INTERFACE GSKT	1
6	418490-001	ASSY APEX-PRO CONNECTOR INTERFACE	1
7	418495-001	TRANSMITTER MEMBRANE SWITCH	1
8	421732-002	COVER SERIAL INTERFACE	1
9	801590-010	PCB APEXPRO TRANSMITTER 420-460 MHZ JPN	1
11	4825-010	FASTENER HOOK VELCRO 5/8DIA	1
12	2003728-001	PAD FOAM 40X15X5.5	1
13	2006763-001	LABEL APEXPRO NO SERIAL PORT ICON	0
14	*2006130-001	LABEL APEXPRO FRONT AHA ENG	0
15	*422196-001	LABEL APEXPRO BACK AHA DMSTC	0
16	2002716-001	BOX MAILER SMALL 4.63 X 1.38 X 6.38	0
17	2002716-002	PACKAGING INSERT CORRUGATED APEX	0
18	404525-001	LABEL BLANK 2 X 3/4	1
19	422159-087	LABEL CARTON APEXPRO TRANSMITTER	1
20	9976-005	BAG ANTI-STATIC 6 X 8	1
23	2001989-014	INSTR SVCE APEXPRO TRANSMITTER PROG ENG	1
24	4851-116	ADH POTTING COMPOUND CLEAR DP-270	1
25	2006761-001	LABEL APEXPRO SINGLE LEAD ENG	0

* Refer to the Label Parts List—2002553 to order these labels.

Label Kits 2002553-0XX

Item Number	Item Description
2002553-001	LABEL KIT APEXPRO TLMY TRANSMITTER ENG
2002553-002	LABEL KIT APEXPRO TLMY TRANSMITTER GER
2002553-003	LABEL KIT APEXPRO TLMY TRANSMITTER FRE
2002553-004	LABEL KIT APEXPRO TLMY TRANSMITTER SWE
2002553-005	LABEL KIT APEXPRO TLMY TRANSMITTER SPA
2002553-006	LABEL KIT APEXPRO TLMY TRANSMITTER ITA
2002553-007	LABEL KIT APEXPRO TLMY TRANSMITTER DUT
2002553-008	LABEL KIT APEXPRO TLMY TRANSMITTER DAN
2002553-009	LABEL KIT APEXPRO TLMY TRANSMITTER NOR
2002553-010	LABEL KIT APEXPRO TLMY TRANSMITTER JAP
2002553-011	LABEL KIT APEXPRO TLMY TRANSMITTER POR
2002553-012	LABEL KIT APEXPRO TLMY TRANSMITTER RUS
2002553-013	LABEL KIT APEXPRO TLMY TRANSMITTER CHI
2002553-014	LABEL KIT APEXPRO TLMY TRANSMITTER HUN
2002553-015	LABEL KIT APEXPRO TLMY TRANSMITTER POL

7 Oximeter Assembly

For your notes

General

The oximeter assembly is an option accessory to the ApexPro transmitter. Refer to the appropriate operator's manual for use.

The oximeter provides portable patient monitoring of an ambulating patient's oxygen saturation and pulse rate. The operation uses red and infrared light emitting diodes to focus optical energy into a vascular bed (like the finger). It then analyzes the heart pulse coordinated response to determine oxygen saturation levels.

Versions of the Assembly

There are two versions of the ApexPro Oximeter assembly and one version of the Nonin Xpod oximeter assembly. Make sure to reference the correct parts list and exploded view for your version of the oximeter.

Assembly	Part Number
Apex Oximeter Assembly (Domestic) (NONIN pn 2621-000)	420364-001
Apex Oximeter Assembly (International) (NONIN pn 2621-100)	421049-002
Nonin Xpod oximeter Assembly (NONIN Model 3013)	2007245-001

Theory of Operation - Pulse Oximetry

Pulse oximeters shine light (red and infrared) through perfused tissue and detect the fluctuating signals caused by arterial blood pressure pulses. Well-oxygenated blood is bright red, while poorly oxygenated blood is dark red. The pulse oximeter determines functional oxygen saturation of arterial hemoglobin from this color difference by measuring the ratio of absorbed red and infrared light as the blood volume fluctuates with each heart beat. Since steady conditions (steady venous blood flow, skin thickness, bone, finger nails, etc.) do not cause fluctuations, they do not affect the saturation reading.

Mathematically:

$$SpO_2 = f\left[\frac{\ln\left(\frac{min}{max}\right)\ red}{\ln\left(\frac{min}{max}\right)\ infrared}\right]$$

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Anything that affects the intensity of the light such as thick or colored skin affects the maximum and minimum proportionally and thus the ratio minimum/maximum does not change. However, if too little light gets through, the pulse oximeter does not function.

Pulse oximeters use two different wavelengths of light (colors) and thus have the ability to determine one component of blood. Pulse oximeters are calibrated to closely approximate functional oxygen saturation values. Pulse oximeter oxygen saturation values will closely approximate laboratory instrument fractional saturation values if the dysfunctional hemoglobin saturation levels are negligible. If the dysfunctional hemoglobin is carboxyhemoglobin or methemoglobin, then the difference between the oxygen saturation value displayed by the Pulse oximeter and the oxygen saturation values determined by the laboratory instrument are greater as the dysfunctional hemoglobin levels rise approximately in accordance with the following formulas:

- SpO2 = O2Hb + COHb + MetHb
- SaO2 = 100 x O2Hb /(100 - COHb - MetHb)

Where:

- SpO2 = Pulse oximeter determined and displayed oxygen saturation in percent
- O2Hb = Fractional oxyhemoglobin saturation in percent
- COHb = Carboxyhemoglobin saturation in percent
- MetHb = Methemoglobin saturation in percent
- SaO2 = Functional oxygen saturation in percent

The following table gives examples of the oximeter readings:

Example 1	Example 2
O_2Hb = 96	O_2Hb = 88
COHb = 0.5	COHb = 8
MetHb = 0.6	MetHb = 2
SpO_2 = 97	SpO_2 = 98
SaO_2 = 97.07	SaO_2 = 97.78

The mathematics are fixed in the pulse oximeter hardware and software. Thus, no field calibrations are needed or are possible. There are no adjustable parts within the pulse oximeter that affect the calibration.

The function, f, depends on the wavelengths of the sensor LEDs. These wavelengths are fixed by specified manufacturing processes and materials. The sensors are checked for correct operation before shipping, so no adjustment or calibration is needed or possible.

Because the pulse oximeter does all critical computations in software and there are no critical parts to drift; no re-calibration is needed.

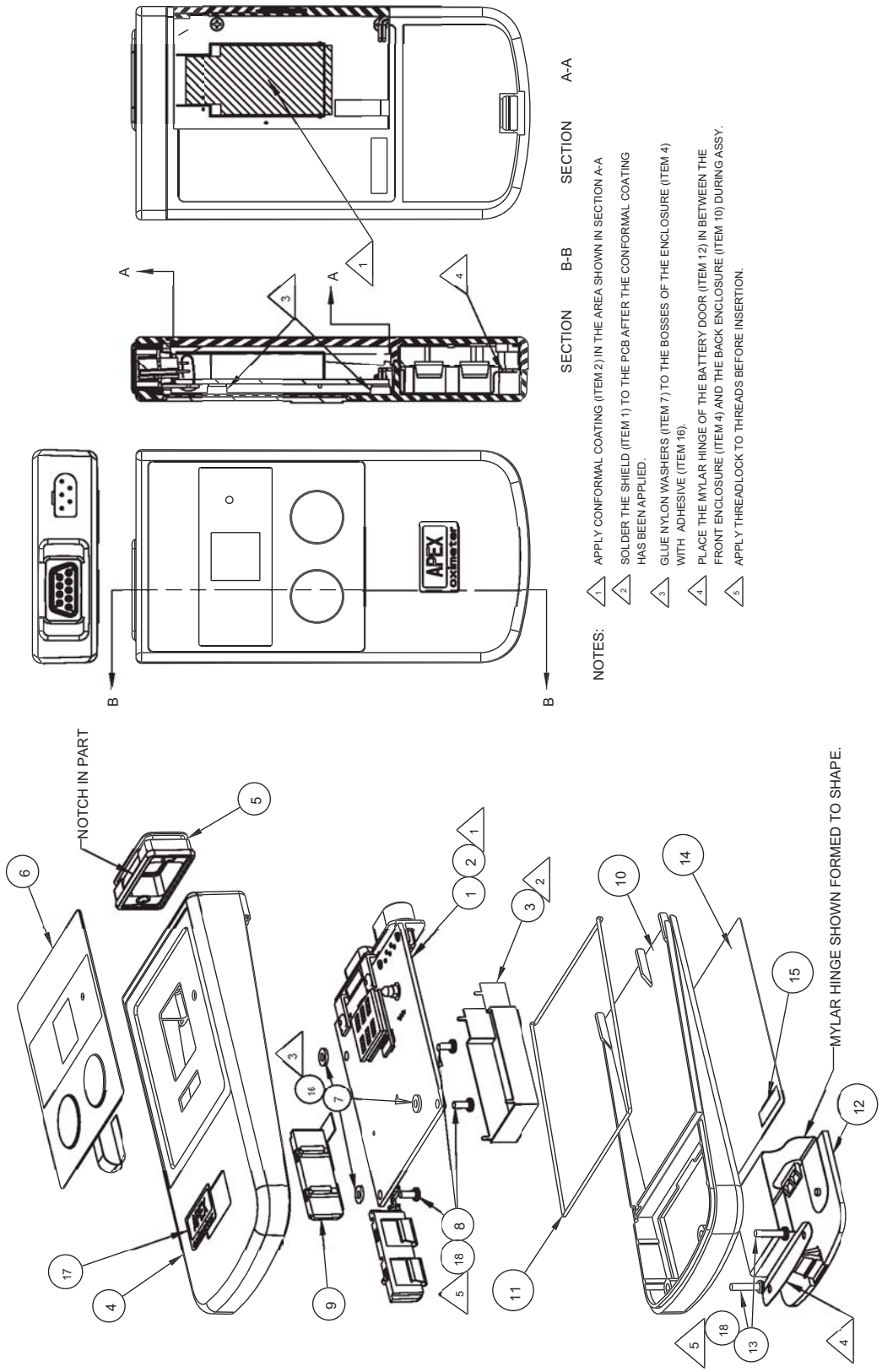
Packaged Parts List 420364-001D/421049-002A

Item Number	Parts List	Part Number	Qty
1	Apex Oximeter Assembly (Domestic)	420364-001	1
	Apex Oximeter Assembly (International)	421049-002	
3	Instructions, Apex Oximeter Telemetry, V6	401566-175	1
	Foreign Instruction sheet		
5	Back label (one of the following):		1
	Label, Apex Oximeter, Back–English, United States	420283-001	
	Label, Apex Oximeter, Back–German	420283-002	
	Label, Apex Oximeter, Back–French	420283-003	
	Label, Apex Oximeter, Back–Swedish	420283-004	
	Label, Apex Oximeter, Back–Spanish	420283-005	
	Label, Apex Oximeter, Back–Italian	420283-006	
	Label, Apex Oximeter, Back–Dutch	420283-007	
	Label, Apex Oximeter, Back–Danish	420283-008	
	Label, Apex Oximeter, Back–English, International	420283-009	

Upper Level Parts List 420364-001D

Item Number	Description	Part Number	Qty
1	PCB Assembly	421191-001	1
2	Conformal Coating (Humiseal)	N/A	
3	RF Shield	N/A	1
4	Enclosure, Front	421187-001	1
5	Bezel, 9-Pin Sub-D	421190-001	1
6	Switch Front Panel	419319-001	1
7	Washer, Nylon	415079-001	1
8	Screw, #2-56 *x* 3/16	4760-015	3
9	Assembly, Battery Contact	415830-001	1
10	Enclosure, Back	411732-001	1
11	O-ring Gasket, Enclosure	415164-001	1
12	Enclosure Battery Door	411733-002	1
13	Screw #2-56 *x* 3/8	4760-017	2
14	Label, Marquette Back	420283-001	1
15	Label. Serial Number	N/A	1
16	Cyanoacrylate (Sicomet 63)	N/A	
17	Label, Product Mark, Apex	418646-002	1
18	Loctite 242	N/A	AR

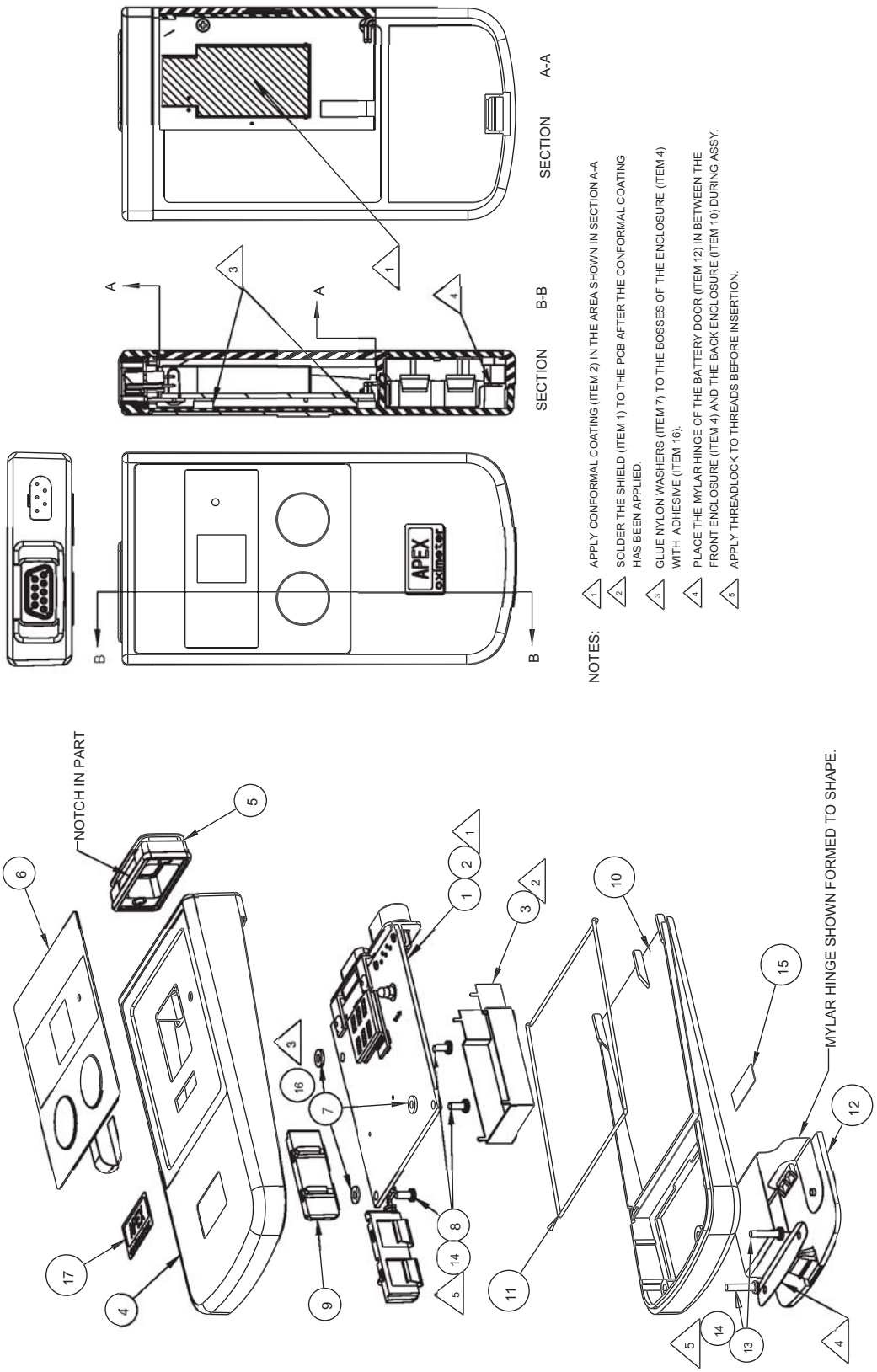
Exploded View 420364-001D


SECTION B-B
SECTION A-A
NOTES:
1. APPLY CONFORMAL COATING (ITEM 2) IN THE AREA SHOWN IN SECTION A-A
2. SOLDER THE SHIELD (ITEM 1) TO THE PCB AFTER THE CONFORMAL COATING HAS BEEN APPLIED.
3. GLUE NYLON WASHERS (ITEM 7) TO THE BOSSES OF THE ENCLOSURE (ITEM 4) WITH ADHESIVE (ITEM 16).
4. PLACE THE MYLAR HINGE OF THE BATTERY DOOR (ITEM 12) IN BETWEEN THE FRONT ENCLOSURE (ITEM 4) AND THE BACK ENCLOSURE (ITEM 10) DURING ASSY.
5. APPLY THREADLOCK TO THREADS BEFORE INSERTION.
APEX oximeter
NOTCH IN PART
MYLAR HINGE SHOWN FORMED TO SHAPE.

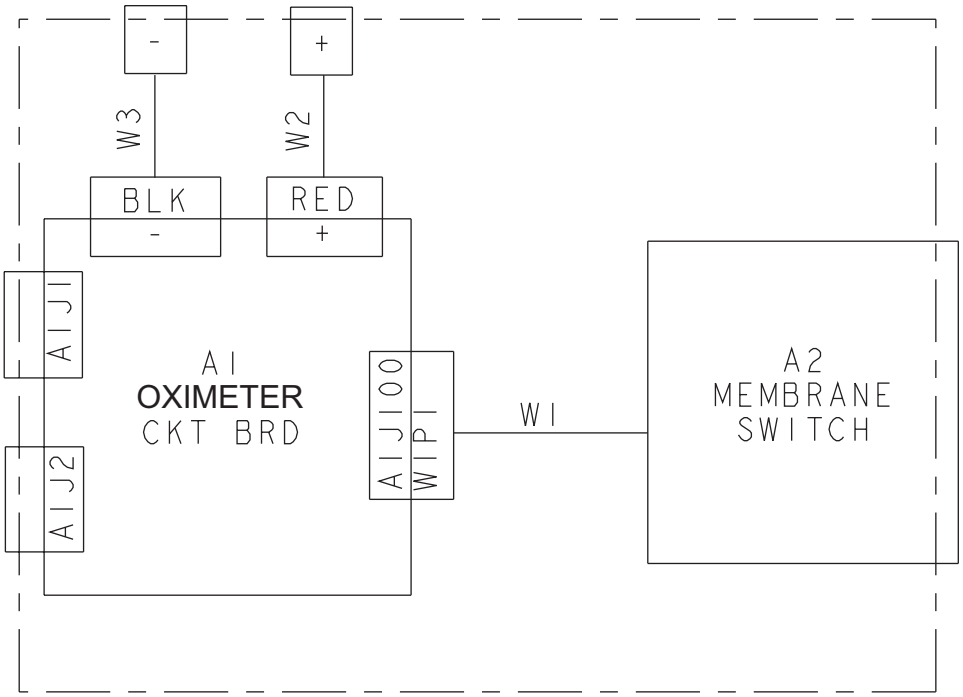
Upper Level Parts List 421049-002A

Item Number	Description	GE Part Number	Nonin Part Number	Qty
1	PCB	421191-001	2465-000	1
2	Conformal Coating (Humiseal)	N/A	0148-000	
3	RF Shield	N/A	2480-000	1
4	Enclosure, Front	421187-001	2455-001	1
5	Bezel, 9-Pin Sub-D	421190-001	2471-100	1
6	Switch Front Panel, International	419319-002	2705-000	1
7	Washer, Nylon	415079-001	2529-010	1
8	Screw, #2-56 *x* 3/16	4760-015	1200-001	3
9	Assembly, Battery Contact	415830-001	2490-001	1
10	Enclosure, Back	411732-001	2455-002	1
11	O-ring Gasket, Enclosure	415164-001	2489-000	1
12	Enclosure Battery Door	411733-002	2455-003	1
13	Screw #2-56 *x* 3/8	4760-017	1200-004	2
14	Loctite 242	N/A	1916-*xxx*	
15	Label. Serial Number	N/A	1672-002	1
16	Cyanoacrylate (Sicomet 63)	N/A	0165-000	
17	Label, Product Mark, APEX	418646-002	2632-000	1

Exploded View 421049-002A


SECTION A-A
SECTION B-B
APEX oximeter
NOTES:
1 APPLY CONFORMAL COATING (ITEM 2) IN THE AREA SHOWN IN SECTION A-A
2 SOLDER THE SHIELD (ITEM 1) TO THE PCB AFTER THE CONFORMAL COATING HAS BEEN APPLIED.
3 GLUE NYLON WASHERS (ITEM 7) TO THE BOSSES OF THE ENCLOSURE (ITEM 4) WITH ADHESIVE (ITEM 16).
4 PLACE THE MYLAR HINGE OF THE BATTERY DOOR (ITEM 12) IN BETWEEN THE FRONT ENCLOSURE (ITEM 4) AND THE BACK ENCLOSURE (ITEM 10) DURING ASSY.
5 APPLY THREADLOCK TO THREADS BEFORE INSERTION.
NOTCH IN PART
MYLAR HINGE SHOWN FORMED TO SHAPE.

Interconnection Diagram 421049-001A/002A



PCB Parts List 421191-001A

Reference Designation	Description	Part Number	Qty
C1	Cap, Al, Electrolytic, 470µF, 10%	0588-007	1
C2, 3	Cap, MONO Chip, 22pF, 10%, (1206)	0421-017	2
C4, 6, 7, 10, 12	Cap, X7R Chip, 0.1µF, 10%, (0805)	1970-033	5
C5, 17	Cap, Tant, 10µF, 10%, 16V, (6032)	1902-106	2
C8	Cap, X7R Chip, 100pF, 50V, 10%, Size (0805)	1971-025	1
C9, 24	Cap, NPO Chip, 1200pF, 10%, (0805)	1971-037	2
C11	Cap, NPO Chip, 10pF, 50V, 10%, Size (0603)	2091-015	1
C13, 14	Cap, Tant, 3.3µF, 5%,	1902-684	2
C15, 16	Cap, Tant, 47µF, 10%, 10V, (5846)	1902-079	2
C18–21	Cap, Low ESR Tant. Chip, 100µF, 10%, 10V, EIA Size (7343) (D)	1892-009	4
C22, 23	Cap, X7R Chip, 0.1µF, 10%, 16V (0603)	2522-029	2
D1-2	Diode, High Speed Switching, (SOT23)	0431-000	2
D3	LED, Bicolor, with formed leads	0577-202	1
D4	Diode Schottky SMD (JEDC)	1896-000	1
DP1, 2	Diode, Dual-Series High-Speed Switching, (SOT23)	2148-000	2
DP3	High-speed switching diode pair common cathode (SOT23)	2539-000	1
DS1	Custom seven segment display	2154-000	1
J1	9-Pin D-sub connector assembly.	2458-000	1
J2	Header, Dual Row, 2 *x* 5	2149-001	1
J3	Header, Dual Row, 2 *x* 4	2149-002	1
J4	4-Position fpc SMD Connector	2213-004	1
J5	5-Pin D-sub Connector	2470-000	1
L1, 2	Inductor, Bobbin Type, SMD	1900-001	2
PS1	Polly Switch, SMD	2538-000	1
Q1, 2	Transistor, NPN Low Noise, (SOT23)	0432-000	2
Q3-8	Transistor, NPN General Purpose, (SOT23)	1895-000	6
Q9, 10	Transistor, P-Channel MOSFET, (SOT23)	1894-000	2
R1	Resistor, 1/8W, 5%, 20 Ω, (1206)	0423-032	1
R2, 5	Resistor, 1/8W, 5%, 8.2 Ω, (1206)	0423-023	2
R3	Resistor, 1/8W, 5%, 10M Ω, (1206)	0423-169	1
R4, 6, 8, 10–12, 14	Resistor, 1/8W, 5%, 360 Ω, (1206)	0423-062	7
R7, 15, 44	Resistor, 1/16W, 5%, 10K Ω, (603)	2145-097	3
R9	Resistor, 1/16W, 5%, 1.5K Ω, (603)	2145-077	1
R13	Resistor, 1/16W, 1%, 2M Ω, (603)	2146-510	1
R16, 20, 21, 25–27	Resistor, 1/8W, 5%, 4.3K Ω, (1206)	0423-088	6

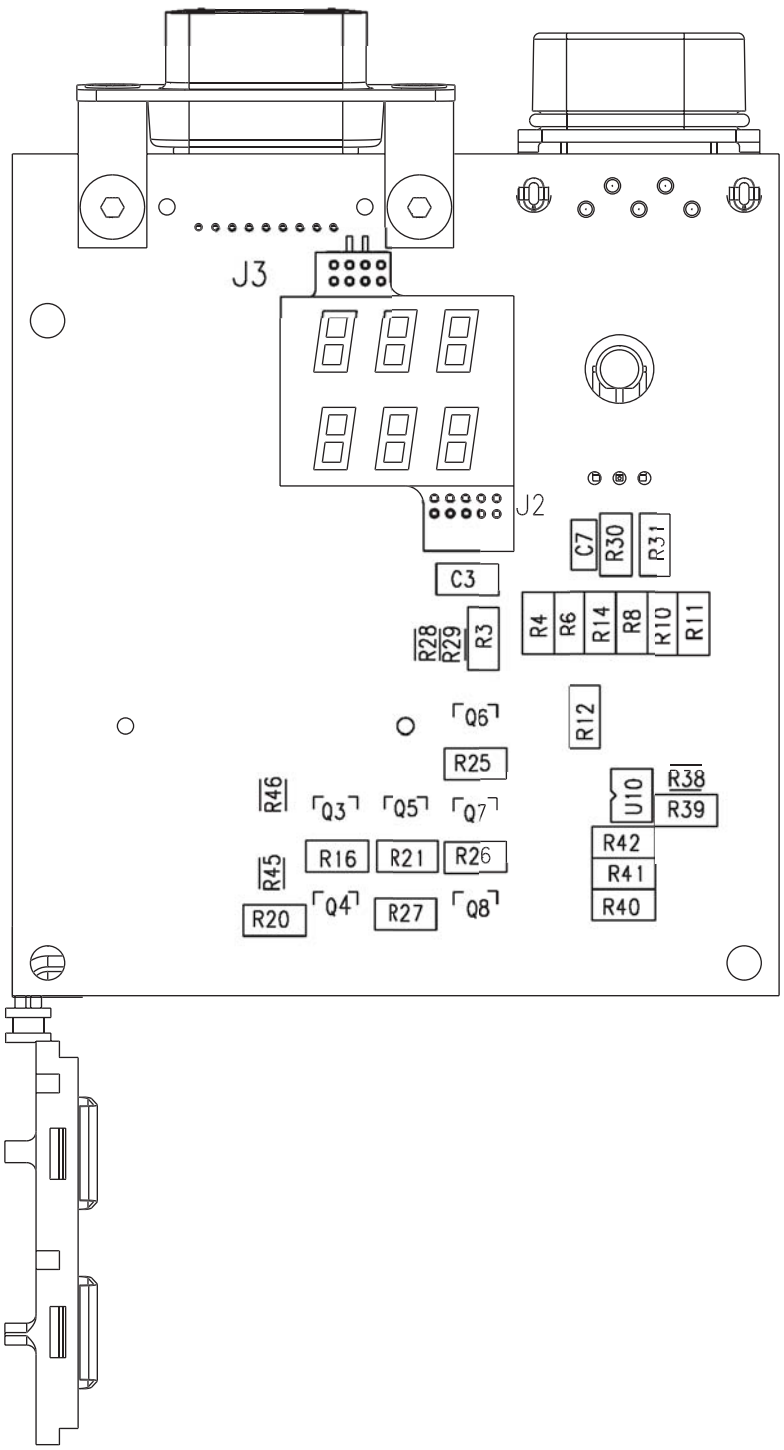
Reference Designation	Description	Part Number	Qty
R17	Resistor, 1/16W, 1%, 20.5K Ω, (603)	2146-319	1
R18, 19	Resistor, 1/16W, 5%, 4.7K Ω, (603)	2145-089	2
R22	Resistor, 1/16W, 1%, 90.9K Ω, (603)	2146-381	1
R23, 28, 29, 36, 45, 46	Resistor, 1/16W, 5%, 100K Ω, (603)	2145-121	6
R24	Resistor, 1/16W, 1%, 909 Ω, (603)	2146-189	1
R30, 31, 37	Resistor, 1/8W, 5%, 330 Ω, (1206)	0423-061	3
R32, 33	Resistor, 1/16W, 5%, 1K Ω, (603)	2145-073	2
R34	Resistor, 1/8W, 1%, 121K Ω, (1206)	0424-393	1
R35, 39, 40	Resistor, 1/8W, 1%, 200K Ω, (1206)	0424-414	3
R38	Resistor, 1/16W, 1%, 100K Ω, (603)	2146-385	1
R41	Resistor, 1/8W, 1% 59K Ω, (1206)	0424-363	1
R42	Resistor, 1/8W, 5%, 3M Ω, (1206)	0423-156	1
R43	Resistor, 1/16W, 5%, 470 Ω, (603)	2145-065	1
U1, 2	IC Compl. FET-Dual Array, (SO8)	2226-000	2
U3	IC, Microcontroller, (44 PIN PLCC)	2498-000	1
U4	IC, Lin Cmos Quad Op-Amp, (SON)	2239-000 2239-001[a]	1
U5	IC, Triple Analog Multiplexer, (SON16-150)	0430-000	1
U6	IC, JFET Single Op-Amp, (SON8-150)	0427-001	1
U7	IC, DMOSFET Quad Analog Switch, (SON14-150)	0429-001	1
U8, 12	IC, Step-up DC-DC Converter, (SO8)	2166-000	2
U9	IC, Micropower Undervoltage Sensing Circuit, (Son8-150)	2092-000	1
U10	Comparitor Tiny Cmos, (SOT23-5)	2348-001 2348-002[b]	1
U11	Optoisolator, Transistor Output	2537-000	1
Y1	Crystal, High Frequency, SMD	0568-001	1
— (#1)	Screw, #4-40 *x* 3/8 button socket cap	1519-000	2
— (#2)	Nut, #4-40 nylon	1520-000	2
— (#3)	O-ring 5-pin connector	2469-000	1
— (#4)	Assembly, Battery Contact	2490-002	1
—	Schematic Diagram	2456-000	—
—	PCB, Processor	2457-000	1

a. Use as alternate parts.

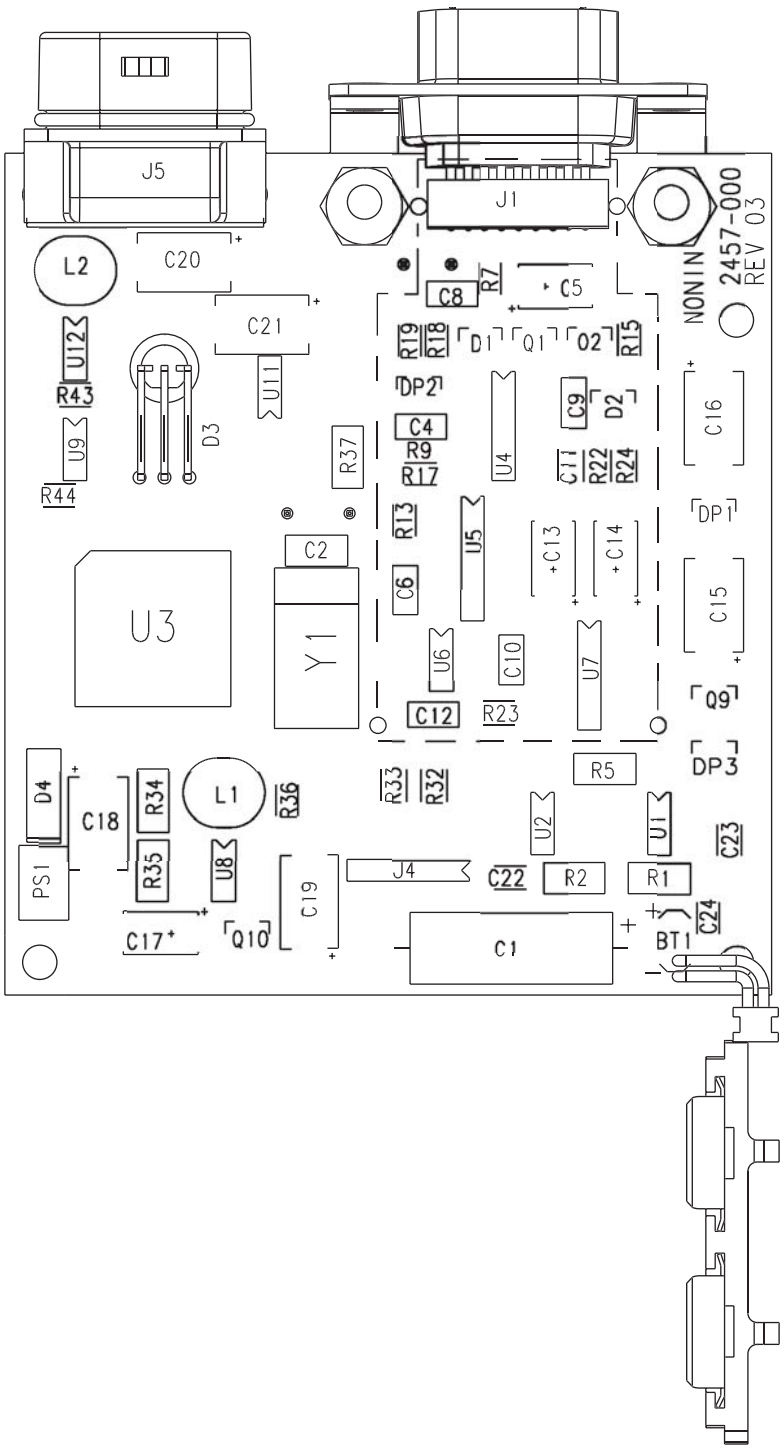
b. Date code must be applied to circuit board per the (*ww/yy*) format.
ww = week of year manufactured, *yy* = last two digits of year manufactured.

Parts Location Diagram 421191-001A

Sheet 1 of 3



Sheet 2 of 3


J5
J1
L2
C20
C21
C8
R7
C5
U12
R43
U9
R44
U11
D3
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R18
D1
Q1
D2
R15
DP2
C4
R9
R17
U4
C9
D2
C16
R37
C11
R22
R24
DP1
R13
U5
C2
C6
C13
C14
C15
U3
Y1
U6
C10
U7
Q9
C12
R23
R5
DP3
D4
C18
R34
L1
R36
R33
R32
U2
U1
C23
PS1
R35
U8
C19
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C17
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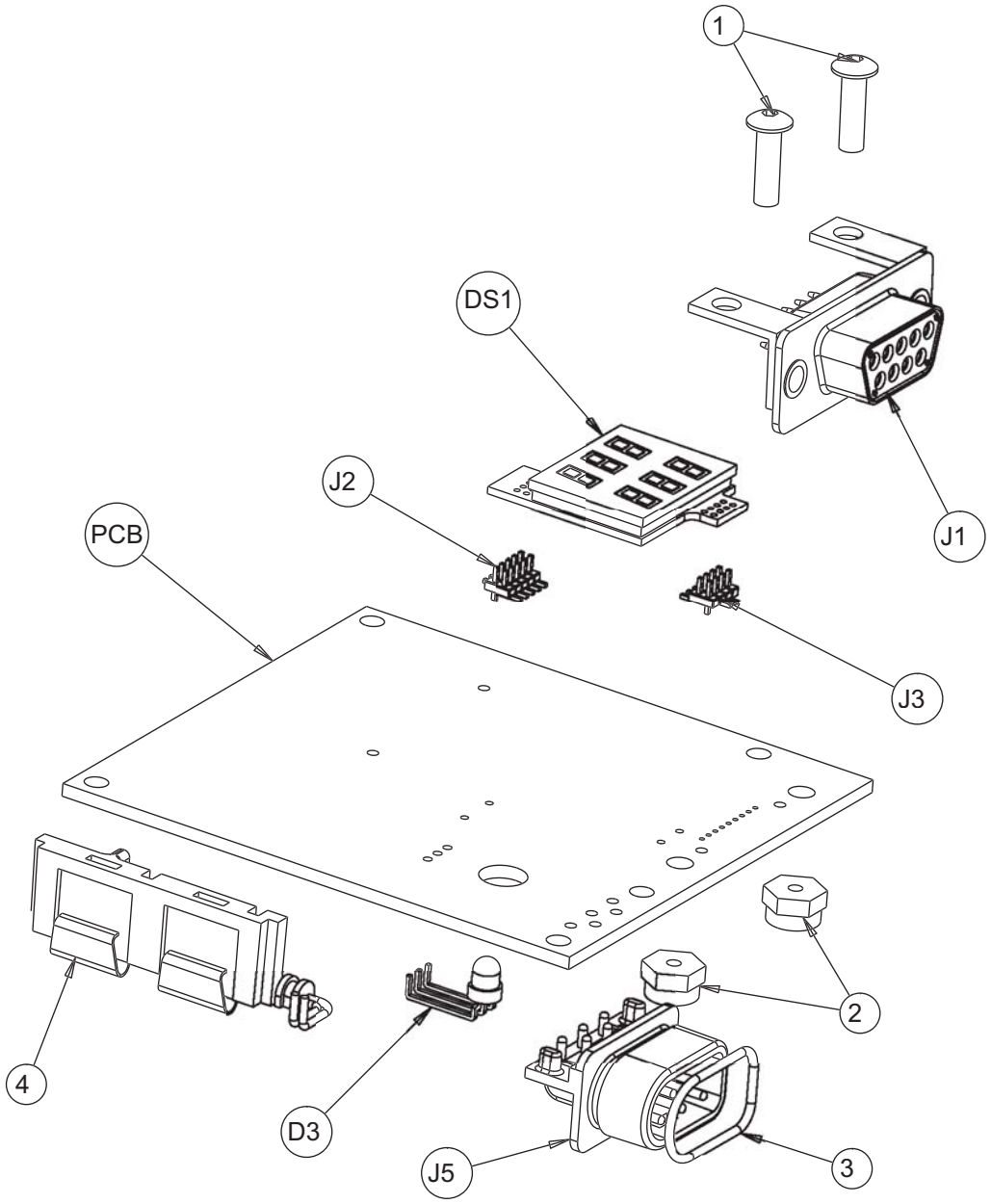
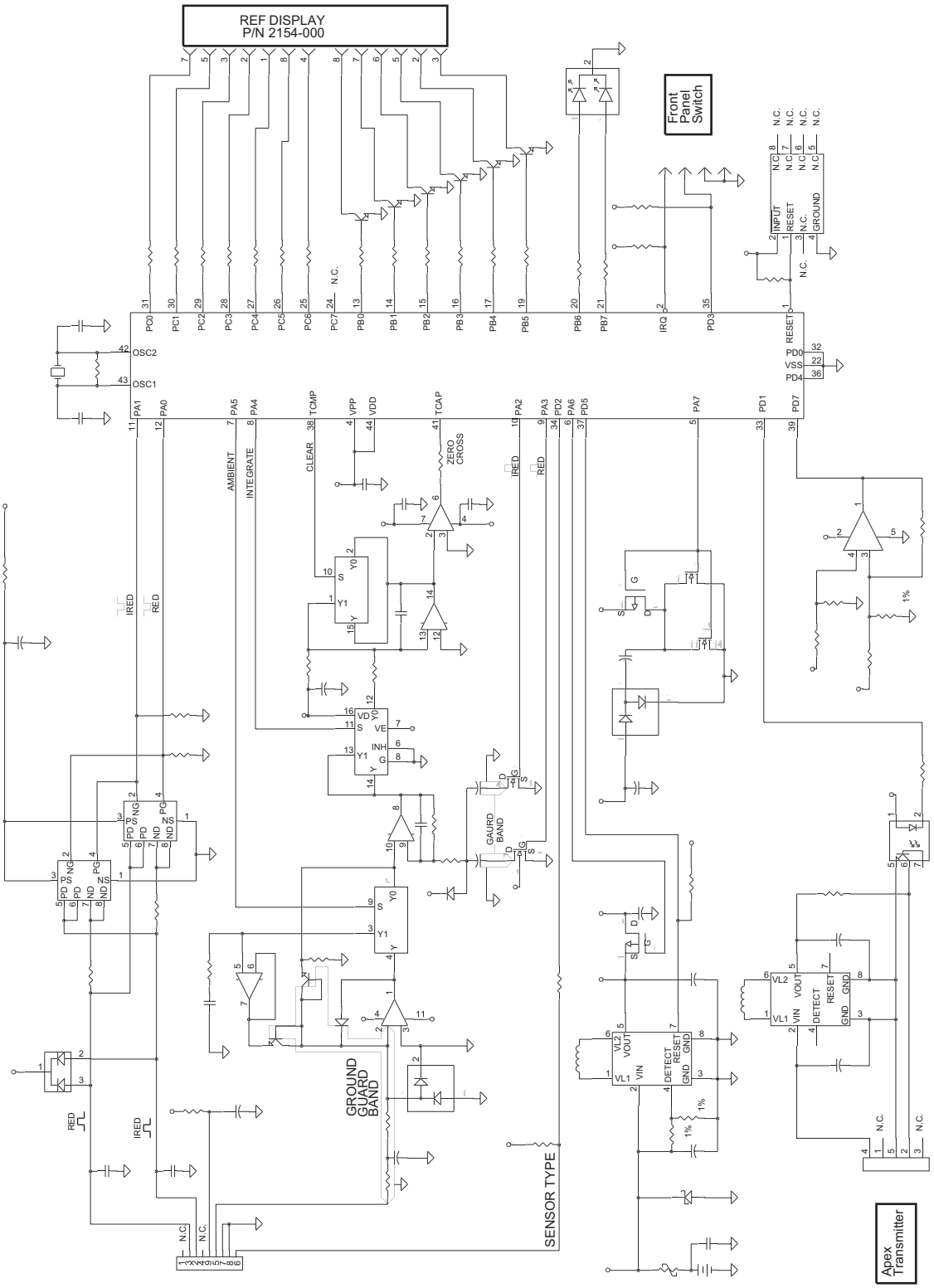
C1
BT1
C24
NONIN
2457-000
REV 03

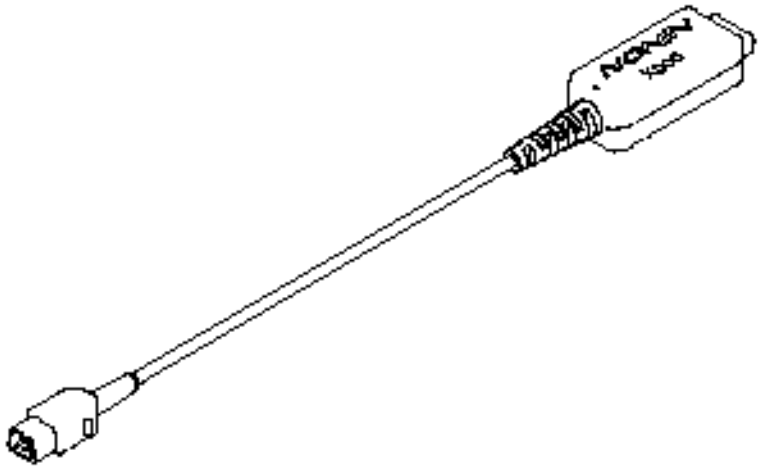
Sheet 3 of 3



PCB Schematic Diagram 2456-000A



Nonin Xpod Oximeter 2007245-001A



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